UK MET OFFICE
GLOBAL DATA MONITORING REPORT

June 2004

Data Assimilation
Meteorological Office
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Air temperature (Degrees C).
:Relative Humidity (%).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:15 degrees (air temperature)
:10 degrees (sea surface temperature)

SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
		≥ 4 degrees	(air temperature)
		≥ 15%	(relative humidity)
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
		≥ 6 degrees	(air temperature)
		≥ 25%	(relative humidity)
	3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AVOSTEST	P	412	48	100	4.4	-6.9	8.2
A8DQ9	P	44	0	95	0.9	5.0	5.1
CG2992	P	450	100	100			
C6FV3	P	68	0	78	0.7	6.9	6.9
C6FV4	P	21	0	29	0.8	9.8	9.8
C6TC2	P	30	0	3	1.6	5.4	5.6
KS005	P	146	0	0	0.6	-4.0	4.1
OWTW2	P	26	0	8	2.8	4.0	4.9
OZTS2	P	46	0	59	1.0	4.3	4.5
PGON	P	44	0	100	0.9	-13.3	13.4
TEST	P	29	100	100			
UCCH	P	30	0	0	0.8	4.5	4.6
VRXO6	P	33	9	100	6.2	-3.8	7.2
VRYO2	P	34	0	3	1.2	5.5	5.7
WDJK	P	68	0	1	1.2	-4.7	4.8
ZCAS2	P	65	0	54	2.8	4.9	5.7
62166	P	26	0	69	3.8	6.8	7.8

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
DPTL	SPEED	26	0	12	5.5	5.1	7.5
ELTY4	SPEED	31	0	100	5.4	8.4	10.0
ELWP8	SPEED	21	0	95	4.8	6.6	8.2
KGJD	SPEED	267	13	51	6.1	9.1	11.0
MYLZ6	SPEED	33	0	39	6.9	5.6	8.9
VNVG	SPEED	52	0	19	4.8	6.6	8.2
VRYS8	SPEED	42	0	100	6.1	5.4	8.1
VSWW5	SPEED	20	0	35	4.9	6.3	7.9
V2HX	SPEED	51	2	75	3.3	5.3	6.2
44138	SPEED	595	0	34	2.6	-6.1	6.7
9MCD3	SPEED	42	0	26	5.3	7.8	9.5

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
AVOSTEST	DIRN.	31	0	0	17.4	*****	133.2
A8CC9	DIRN.	22	0	0	55.8	-76.7	94.8
ELWX5	DIRN.	235	0	0	87.0	-23.2	90.0
VRWE9	DIRN.	24	0	0	31.9	34.4	46.9
VRYO2	DIRN.	24	0	0	30.7	34.8	46.4
3FZM6	DIRN.	27	26	0	116.7	9.6	117.1
62116	DIRN.	23	0	0	9.4	38.9	40.0

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
DEOT	T	97	0	100	3.0	6.1	6.8
D5XH	T	22	0	100	2.6	4.9	5.6
KS025	T	81	2	100	4.3	4.1	5.9
OYZC	T	129	1	100	3.6	5.1	6.3
TEST	T	29	59	100	1.3	5.6	5.7
UCTP	T	31	3	100	5.2	5.3	7.5
WCQ8110	T	151	7	100	3.3	5.2	6.2
WCW9126	T	111	13	100	2.6	9.4	9.8
WWU8	T	26	19	100	1.9	11.6	11.7
ZCBU2	T	31	0	100	5.2	4.4	6.8
45144	T	356	0	100	1.7	4.2	4.6
46081	T	698	2	100	2.2	9.1	9.4

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGDX	RH	70	0	100	14.6	-16.1	21.8
CG2965	RH	44	0	100	13.8	15.5	20.7
CTFH	RH	28	0	100	11.5	-18.2	21.5
DFPC	RH	157	0	100	6.4	24.5	25.4
DGVZ	RH	34	0	100	7.0	16.6	18.0
DQVN	RH	62	0	100	6.9	-16.7	18.1

FNAT	RH	60	0	100	5.2	19.6	20.3
H9TO	RH	40	0	100	9.9	19.1	21.5
PJVQ	RH	35	0	100	5.3	-15.9	16.7
P3BP9	RH	31	0	100	10.8	19.7	22.4
S6IH	RH	21	0	100	25.3	6.7	26.2
VRXO6	RH	20	0	100	15.9	-23.4	28.3
3EZF5	RH	70	0	100	9.7	21.7	23.8
62145	RH	516	0	100	7.9	16.0	17.8
62402	RH	45	0	100	10.2	-22.8	25.0

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8BZ6	SST	48	0	100	1.5	-3.5	3.8
CG2992	SST	79	33	119	2.3	2.7	3.5
ELZH9	SST	44	5	100	1.9	6.6	6.8
FNJI	SST	108	0	100	1.1	3.2	3.3
H3SM	SST	74	0	34	1.4	-3.3	3.5
JDWX	SST	143	0	39	1.5	-3.2	3.6
KGJD	SST	364	73	107	1.4	1.7	2.2
KGJX	SST	59	0	100	1.2	3.0	3.3
KRPB	SST	37	0	100	1.6	-3.9	4.2
OYZC	SST	129	0	48	3.7	3.8	5.3
TEST	SST	23	100	152			
UASX	SST	23	0	43	1.4	-3.6	3.8
UAVH	SST	20	0	95	3.4	-5.8	6.7
UAXG	SST	21	0	100	0.2	4.5	4.5
UBAM	SST	47	0	66	1.9	4.1	4.6
UBLX	SST	24	0	67	1.3	-4.3	4.5
UCBM	SST	32	0	56	2.0	-3.6	4.1
UFLC	SST	20	30	100	2.0	5.4	5.8
UHOM	SST	36	0	61	1.5	-4.3	4.5
WAUY	SST	36	0	92	1.4	-4.8	4.9
YJQA8	SST	45	0	47	2.3	3.5	4.2
3FDV6	SST	25	0	100	1.5	5.6	5.7
3FKM8	SST	35	0	100	1.7	-5.1	5.4
44008	SST	717	0	92	1.2	-4.7	4.9
44011	SST	715	0	94	0.8	-4.1	4.2
45003	SST	239	0	71	1.6	-4.2	4.5
45142	SST	707	0	83	1.3	3.1	3.4
45143	SST	707	0	96	1.2	-4.1	4.3
45144	SST	365	4	100	1.2	6.4	6.6
45151	SST	638	0	97	1.4	3.8	4.1
46025	SST	238	0	96	0.8	3.6	3.7
9VWZ	SST	20	25	100	1.2	-0.9	1.5

Figure 1. SHIP/SYNOP mean daily count. JUNE 2004
All hours
Global average number of observations in 24 hours = 20678

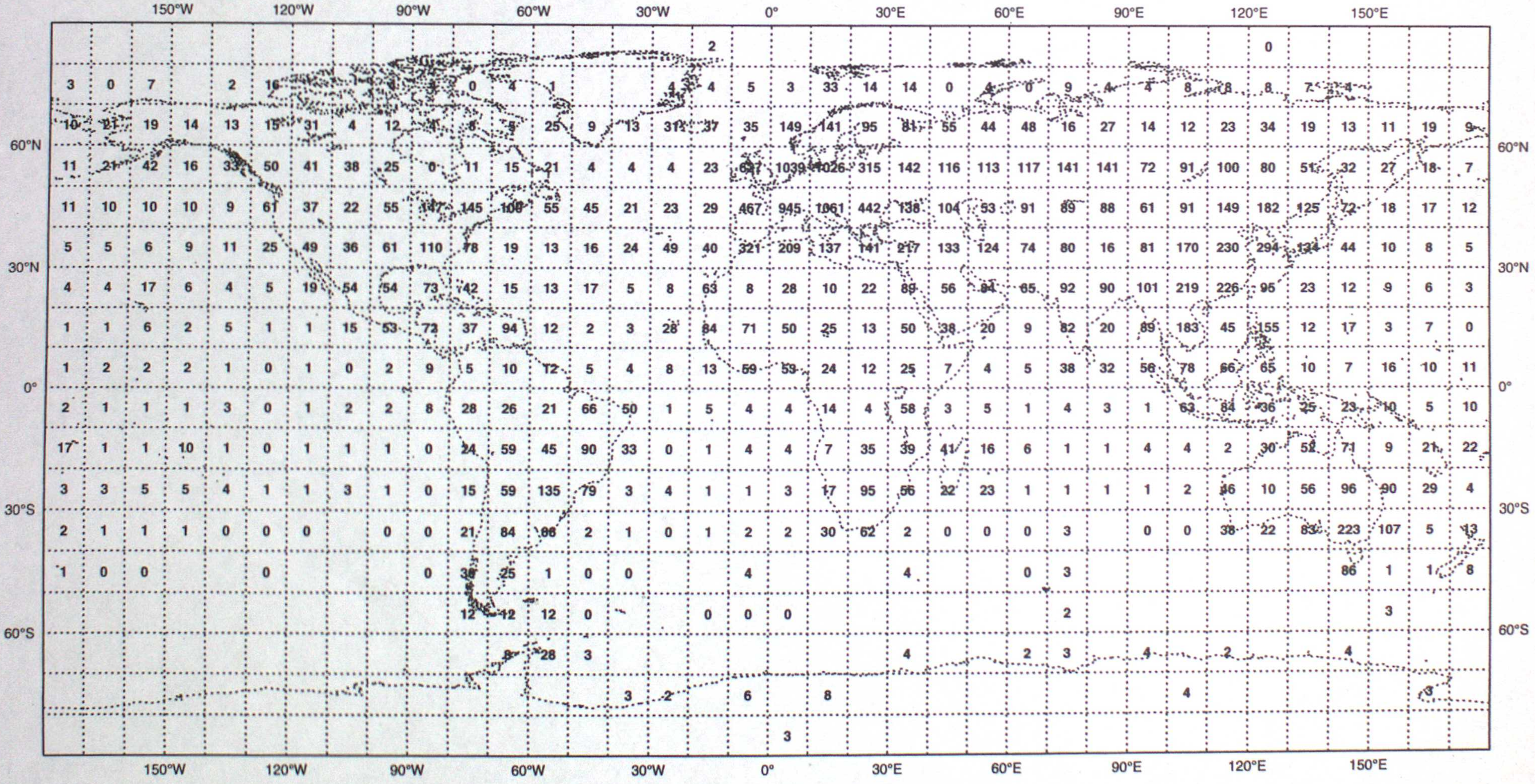

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2 0
3 0 7 2 16 4 3 0 4 1 4 4 5 3 33 14 14 0 4 0 9 4 4 8 8 8 7 4
10 21 19 14 13 15 31 4 12 4 6 5 25 9 13 31 37 35 149 141 95 81 55 44 48 16 27 14 12 23 34 19 13 11 19 9
11 21 42 16 33 50 41 38 25 0 11 15 21 4 4 4 23 637 1039 1026 315 142 116 113 117 141 141 72 91 100 80 51 32 27 18 7
11 10 10 10 9 61 37 22 55 147 145 108 55 45 21 23 29 467 945 1061 442 138 104 53 91 89 88 61 91 149 182 125 72 18 17 12
5 5 6 9 11 25 49 36 61 110 78 19 13 16 24 49 40 321 209 137 141 217 133 124 74 80 16 81 170 230 294 134 44 10 8 5
4 4 17 6 4 5 19 54 54 73 42 15 13 17 5 8 63 8 28 10 22 89 56 84 65 92 90 101 219 226 95 23 12 9 6 3
1 1 6 2 5 1 1 15 53 72 37 94 12 2 3 28 84 71 50 25 13 50 38 20 9 82 20 89 183 45 155 12 17 3 7 0
1 2 2 2 1 0 1 0 2 9 5 10 12 5 4 8 13 59 53 24 12 25 7 4 5 38 32 56 78 66 65 10 7 16 10 11
2 1 1 1 3 0 1 2 2 8 28 26 21 66 50 1 5 4 4 14 4 58 3 5 1 4 3 1 63 84 36 25 23 10 5 10
17 1 1 10 1 0 1 1 1 0 24 59 45 90 33 0 1 4 4 7 35 39 41 16 6 1 1 4 4 2 30 52 71 9 21 22
3 3 5 5 4 1 1 3 1 0 15 59 135 79 3 4 1 1 3 17 95 56 22 23 1 1 1 1 2 46 10 56 96 90 29 4
2 1 1 1 0 0 0 0 0 21 84 86 2 1 0 1 2 2 30 62 2 0 0 0 3 0 0 38 22 83 223 107 5 13
1 0 0 0 0 38 25 1 0 0 4 4 0 3 86 1 1 8
12 12 12 0 0 0 0 2 3
8 28 3 4 2 3 4 2 4
3 2 6 8 4 3
3

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ : Percentage of observations flagged excluding those with gross errors

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|
≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).
≥ 3 degrees (sea surface temperature).

2.SD
≥ 6 hPa (pressure),
≥ 80 degrees (direction).
≥ 5 degrees (sea surface temperature).

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
14919	-20.1	49.5	P	539	29	52	0.9	1.0	1.3
23697	13.0	57.9	P	234	69	91	4.3	6.9	8.1
25572	87.3	-130.6	P	193	53	100	3.4	11.0	11.5
52513	19.2	134.2	P	401	27	33	3.1	0.3	3.2
52684	11.2	141.5	P	294	3	100	2.7	-10.0	10.4
56558	-48.6	98.1	P	147	16	100	4.6	5.7	7.3
71618	-65.9	-10.4	P	220	58	90	7.8	-5.4	9.5

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
48613	75.2	-15.1	DIRN.	84	5	0	24.0	*****	158.0
52523	28.7	127.4	DIRN.	173	2	0	38.9	74.5	84.1
52651	25.8	145.8	DIRN.	184	0	0	18.7	42.8	46.7

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
17523	-40.3	21.1	SST	173	0	82	0.9	3.6	3.7
22614	34.5	129.3	SST	33	0	61	2.7	3.8	4.7
31543	-36.7	-52.6	SST	234	0	70	1.3	3.8	4.1
32693	11.4	-139.9	SST	615	0	100	0.1	3.6	3.7
33502	-33.1	-7.8	SST	91	0	100	0.3	3.7	3.7
43535	28.6	-112.1	SST	69	0	96	1.0	4.1	4.2
43554	29.8	-113.0	SST	70	0	94	1.2	4.1	4.3
43563	30.7	-113.3	SST	70	0	99	1.0	4.7	4.8
44511	40.0	-49.7	SST	302	0	100	1.4	-6.0	6.2
44614	61.0	-39.8	SST	637	3	87	2.8	7.0	7.5
46972	17.8	176.3	SST	157	0	100	0.4	4.7	4.7
52837	-2.5	170.5	SST	61	49	100	2.0	-6.3	6.6
65561	84.7	-65.4	SST	561	2	48	1.8	3.0	3.5
65564	84.5	-76.2	SST	572	6	57	2.3	3.3	4.0
71629	-57.4	-45.1	SST	144	3	96	2.0	7.0	7.2

Figure 2. DRIFTER mean daily count. JUNE 2004
All hours
Global average number of observations in 24 hours = 11405

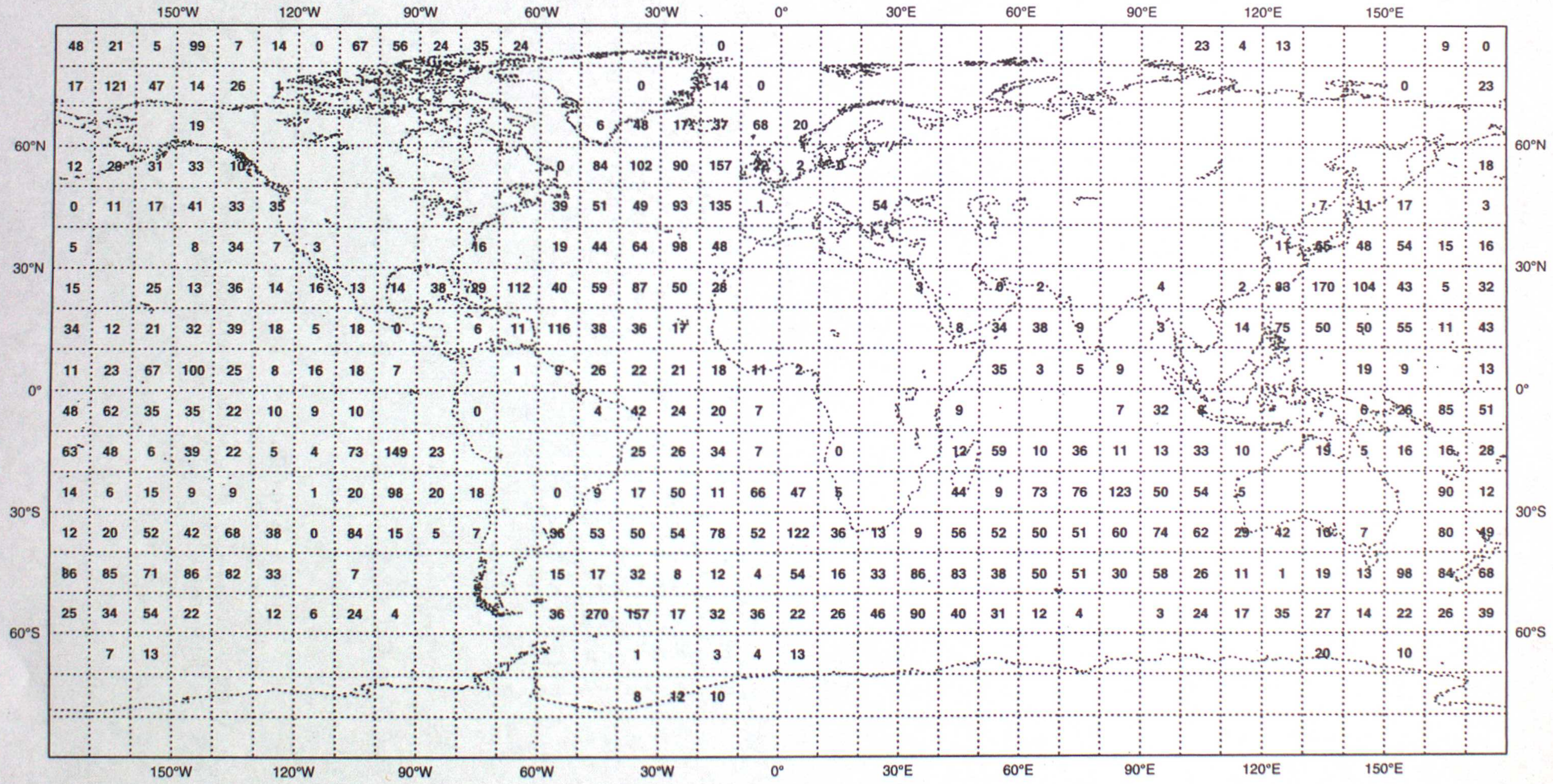

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
48 21 5 99 7 14 0 67 56 24 35 24 0 23 4 13 9 0
17 121 47 14 26 1 0 14 0 0 23
19 6 48 17 37 68 20
12 28 31 33 10 0 84 102 90 157 22 2 18
0 11 17 41 33 35 39 51 49 93 135 1 54 7 11 17 3
5 8 34 7 3 16 19 44 64 98 48 11 65 48 54 15 16
15 25 13 36 14 16 13 14 38 129 112 40 59 87 50 28 3 6 2 4 2 88 170 104 43 5 32
34 12 21 32 39 18 5 18 0 6 11 116 38 36 17 8 34 38 9 3 14 75 50 50 55 11 43
11 23 67 100 25 8 16 18 7 1 9 26 22 21 18 11 2 35 3 5 9 19 9 13
48 62 35 35 22 10 9 10 0 4 42 24 20 7 9 7 32 6 6 26 85 51
63 48 6 39 22 5 4 73 149 23 25 26 34 7 0 12 59 10 36 11 13 33 10 19 5 16 16 28
14 6 15 9 9 1 20 98 20 18 0 9 17 50 11 66 47 5 44 9 73 76 123 50 54 5 90 12
12 20 52 42 68 38 0 84 15 5 7 36 53 50 54 78 52 122 36 13 9 56 52 50 51 60 74 62 29 42 16 7 80 49
86 85 71 86 82 33 7 15 17 32 8 12 4 54 16 33 86 83 38 50 51 30 58 26 11 1 19 13 98 84 68
25 34 54 22 12 6 24 4 36 270 157 17 32 36 22 26 46 90 40 31 12 4 3 24 17 35 27 14 22 26 39
7 13 1 3 4 13 20 10
8 12 10

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for synops & autosynops.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Surface pressure (hPa).

Parameters monitored

:HT(m) :Station height (in metres) as given in WMO No. 9 Vol A

:RP :Pressure reporting practice
M=mean sea level pressure (hPa) reported.
S=Station level pressure reported.
8=Geopotential height (m) of 850 hPa surface reported.
7=Geopotential height (m) of 700 hPa surface reported.

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)

SELECTION CRITERIA :NOBS ≥ 20 ,and one or more of the following:

1.|bias| ≥ 4 hPa
2. SD ≥ 6 hPa
3.PGE ≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION JUN 200

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.3W	2	MS	59	0	0	0	1.2	-9.3	9.4
61492	16.1N	13.5W	18	MS	70	0	0	6	2.1	4.0	4.5
62056	32.8N	21.8E	625	S8	75	0	0	1	1.1	-5.2	5.3
62840	9.6N	31.6E	387	MS	58	3	5	9	2.1	-5.0	5.4
63801	4.9S	29.6E	882	S8	83	3	4	4	2.6	7.2	7.7
63881	8.0S	31.6E	1923	S	43	0	0	0	0.6	12.3	12.3
65355	9.8N	1.1E	342	MS	108	2	2	1	1.3	-12.3	12.4
66285	11.8S	19.9E	1357	8	25	25	100	4			
68030	18.5S	25.6E	1071	8	79	1	1	0	2.8	4.9	5.6
68300	26.6S	15.1E	16	MS	92	53	58	0	0.3	-14.4	14.4
68396	26.5S	31.3E	641	S8	46	0	0	0	1.2	4.9	5.0
68575	30.0S	30.0E	1175	S8	117	117	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	117	2	2	1	0.8	11.8	11.8
36982	41.9N	78.2E	3635	S7	109	1	1	2	1.4	6.4	6.6
38565	40.6N	65.7E	485	MS	117	117	100	0			
38846	38.4N	70.0E	1437	S8	78	0	0	0	1.0	-6.1	6.2
40435	24.5N	44.4E	991	MS	58	0	0	0	0.5	7.9	7.9
40700	39.6N	47.9E	45	MS	115	1	1	1	1.0	-5.1	5.2
40713	37.4N	46.3E	1475	MS	113	24	21	1	2.1	14.0	14.2
40726	36.8N	45.7E	1384	MS	110	0	0	1	1.1	4.0	4.1
40741	36.5N	61.2E	235	MS	114	0	0	0	0.8	-4.5	4.6
40743	36.2N	57.7E	978	MS	110	0	0	0	1.1	4.4	4.5
40780	33.6N	46.4E	1362	MS	108	0	0	1	0.8	5.5	5.6
41254	23.1N	57.6E	1755	S8	110	110	100	0			
44416	28.6N	81.6E	720	MS	71	1	1	0	1.6	4.3	4.6
47022	40.8N	128.2E	1224	S	93	0	0	1	1.1	4.3	4.4
47678	33.1N	139.8E	79	MS	116	0	0	0	0.6	-8.9	8.9
48924	21.1N	101.5E	644	S	52	1	2	0	0.6	10.9	10.9
48925	20.7N	102.0E	550	S	45	0	0	0	0.6	-9.4	9.4
48938	19.2N	101.7E	326	MS	45	32	71	0	0.2	14.7	14.7
50727	47.2N	119.9E	1028	MS	117	0	0	0	0.6	4.5	4.5
50978	45.3N	130.9E	234	MS	117	0	0	0	0.7	-5.2	5.2
52866	36.6N	101.8E	2262	S	117	0	0	0	0.8	-4.3	4.4
53646	38.3N	109.8E	1058	MS	117	0	0	0	0.8	-11.2	11.2
56462	29.0N	101.5E	2994	S	117	0	0	0	1.0	8.7	8.8
56768	25.0N	101.5E	1773	S	117	0	0	0	0.6	-5.4	5.4
57816	26.6N	106.7E	1074	MS	117	47	40	0	0.4	-14.5	14.5
59663	21.8N	112.0E	22	MS	117	0	0	0	0.5	-7.0	7.0

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80434	9.2N	66.0W	125	MS	20	1	5	0	1.0	-5.3	5.4
82181	2.0S	54.1W	146	MS	79	0	0	0	0.5	4.7	4.7
82586	5.2S	39.3W	212	MS	87	2	2	0	0.6	-4.3	4.3
82704	7.6S	72.7W	170	MS	73	1	1	1	1.0	-4.7	4.8
83235	12.4S	46.4W	604	MS	86	1	1	0	0.6	6.2	6.2
83332	14.1S	46.4W	826	S	85	2	2	0	0.5	13.6	13.6
83470	17.9S	50.9W	727	MS	85	1	1	2	1.4	-6.1	6.3
83531	18.6S	46.5W	940	MS	86	0	0	0	0.6	-7.0	7.0
83836	25.5S	50.6W	837	MS	86	0	0	2	1.1	-5.5	5.6
84401	5.2S	80.6W	49	MS	97	0	0	0	0.7	4.0	4.1

84455	6.5S	76.4W	281	MS	68	0	0	0	1.7	7.6	7.8
84472	7.1S	78.5W	2620	S	44	0	0	0	0.7	-5.0	5.0
84688	13.7S	73.4W	3444	S	36	0	0	0	0.4	-12.4	12.4
84720	14.9S	75.0W	567	MS	45	0	0	0	0.6	5.1	5.1
84782	18.1S	70.3W	468	MS	75	0	0	3	1.5	7.5	7.6
85140	14.3S	67.4W	140	MS	58	0	0	0	0.8	6.4	6.4
85264	18.5S	64.1W	1998	S	56	0	0	0	1.6	5.2	5.4
85312	19.8S	63.9W	992	S	45	3	7	7	1.5	-12.1	12.2
85406	18.3S	70.3W	55	M	114	0	0	0	0.8	4.3	4.4
85432	22.5S	68.9W	2320	S8	80	0	0	0	0.6	4.1	4.1

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71060	52.5N	116.1W	230	MS	116	116	100	0			
71181	47.1N	55.3W	29	MS	117	0	0	0	0.6	-6.2	6.2
71619	48.0N	65.3W	46	MS	321	204	64	0	0.7	0.3	0.8
72327	36.1N	86.7W	182	MS	116	0	0	0	0.8	4.0	4.1
76055	31.0N	114.9W	440	MS	67	67	100	0			
76225	28.6N	106.1W	1435	MS	81	0	0	0	1.0	-4.3	4.4
76543	22.0N	98.8W	104	MS	66	0	0	2	1.7	9.2	9.4
76658	19.2N	103.7W	494	MS	40	1	3	0	0.7	5.7	5.7
76762	17.5N	99.5W	1265	MS	83	5	6	1	0.9	5.6	5.7
76843	16.8N	93.1W	528	MS	82	0	0	93	0.8	-4.6	4.7
78588	17.2N	87.5W	44	M	115	114	99	0	0.0	-1.9	1.9
78655	14.0N	89.6W	725	MS	63	1	2	0	1.0	10.9	10.9

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	24	0	0	4	1.5	9.5	9.6
94130	14.8S	131.9E	120	MS	117	0	0	0	1.0	5.5	5.6
94146	23.1S	135.6E	18	MS	56	0	0	84	2.4	-6.4	6.8
96505	3.7N	115.7E	-9999	8	23	23	100	0			
97378	10.7S	123.1E	1	MS	41	40	98	0	0.0	-14.9	14.9
98851	6.1N	125.2E	14	S	92	5	5	99	1.7	-13.0	13.1

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	115	0	0	0	0.5	5.8	5.8
06239	54.9N	44.7E	49	MS	351	89	25	18	8.3	3.4	9.0
06685	47.0N	9.1E	515	MS	117	0	0	0	0.9	6.1	6.2
06780	46.8N	9.8E	2690	S7	117	0	0	0	0.7	4.4	4.5
08912	42.9N	0.8W	1434	MS	92	92	100	0			
08922	42.8N	0.2W	1660	MS	85	85	100	0			
10850	48.8N	10.7E	457	MS	351	0	0	0	0.5	-5.3	5.3
11116	47.5N	10.8E	870	MS	57	0	0	0	0.7	4.2	4.3
13269	44.3N	19.9E	176	MS	111	0	0	2	0.9	7.6	7.7
14554	44.9N	18.4E	136	S	55	2	4	5	1.2	-12.9	13.0
16344	39.3N	16.4E	1710	S8	116	0	0	0	1.0	4.7	4.8
16538	40.1N	9.3E	1022	S	28	0	0	0	0.7	9.2	9.2
17088	40.5N	39.5E	1219	S8	86	0	0	0	1.1	5.0	5.1
17203	38.9N	40.5E	1177	S8	103	0	0	0	0.8	4.7	4.8
17521	35.2N	33.5E	285	MS	86	85	99	64	0.0	-0.5	0.5

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	105	0	0	0	1.8	-6.8	7.0
89257	75.4S	59.9W	40	S	670	1	0	1	1.9	-7.3	7.5
89263	66.0S	66.1W	20	M	237	5	2	0	1.1	12.4	12.4

89264	71.4S	68.9W	780	S	271	0	0	0	1.2	7.4	7.5
89266	72.2S	60.2W	91	S	249	243	98	0	4.8	-7.9	9.2
89272	75.0S	70.8W	1395	S	261	261	100	0			
89610	65.9S	113.1E	90	S	241	0	0	0	1.6	-7.9	8.1
89614	66.6S	111.2E	500	M	256	256	100	0			
89744	74.0S	43.1E	3353	S	265	1	0	0	0.8	7.3	7.3
89767	70.9S	69.9E	84	S	117	0	0	2	2.2	-4.1	4.7
89847	67.6S	146.2E	30	S	240	2	1	18	2.9	-7.3	7.9

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in $m\ s^{-1}$

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3715	0	44	1.3	-0.2	3678	0	43	0	4.8	0.1
AAL	7567	0	37	1.5	0.1	7097	0	38	0	5.6	-0.1
AAR	1516	0	7	1.6	-0.4	1505	0	7	0	6.9	0.0
ACA	2586	1	10	1.6	0.0	1955	0	12	0	7.5	0.4
ACI	85	0	6	0.9	0.1	85	0	6	0	4.9	-0.1
AEA	1293	0	3	1.4	0.1	1077	0	4	0	7.8	-0.1
AEL	340	1	5	1.1	-0.3	313	0	6	0	7.5	-0.3
AFL	776	1	3	1.9	0.0	434	0	3	0	7.6	0.1
AFR	1530	0	6	1.5	0.1	1497	0	8	0	8.6	-0.3
AJM	386	0	1	1.3	-0.1	325	0	3	0	8.2	-0.6
AJX	271	1	4	2.1	1.2	271	1	4	0	7.8	0.0
AMT	2076	1	43	1.0	0.1	2056	0	43	0	4.8	-0.1
AMX	439	2	4	1.6	0.2	399	0	70	0	8.8	-0.5
ANA	27	0	0	1.5	-0.1	27	0	15	0	18.6	-3.1
ANZ	5070	0	27	1.4	0.2	5060	0	27	0	6.7	0.6
ARG	42	7	29	2.3	0.8	25	0	24	0	14.0	2.6
ATN	181	1	100	3.5	-0.3	167	0	78	0	9.6	1.5
AVA	310	0	0	1.5	0.6	307	0	3	0	7.3	0.2
AVN	144	0	49	1.4	-0.1	146	0	48	0	6.2	0.7
AXF	28	0	18	1.4	-0.6	28	0	18	0	6.6	-1.2
AZA	599	1	3	1.5	0.0	502	0	4	0	8.5	0.1
BAL	415	1	8	1.2	-0.2	399	1	11	0	9.5	-1.3
BAW	702	1	13	1.8	-0.6	470	0	14	0	6.7	0.6
BBR	255	2	4	1.9	0.6	252	0	42	0	12.1	3.7
BPA	370	0	8	1.7	-0.3	372	0	9	0	8.0	-0.6
BWA	431	0	2	1.3	-0.2	385	0	6	0	10.0	-0.7
CAL	40	3	8	1.6	-0.1	43	0	9	0	8.8	-0.2
CCA	398	1	18	2.5	0.4	427	0	100	0	10.9	-0.4
CES	430	2	8	1.7	0.2	429	0	8	0	7.8	0.6
CFC	37	0	5	1.4	-0.2	36	0	8	0	6.7	1.4
CFG	1001	0	4	1.4	0.0	836	0	6	0	8.9	-0.6
CKK	145	1	8	1.5	0.6	150	0	9	0	8.2	0.4
CKS	483	1	31	2.0	0.2	424	0	28	0	7.4	0.0
CLX	385	1	2	1.8	-0.6	245	1	4	0	7.0	0.0
COA	214	1	36	1.2	0.0	167	0	41	0	8.5	-0.5
CPA	27	0	22	1.8	0.3	27	0	19	0	6.1	0.5
CRL	649	0	2	1.4	0.4	625	0	5	0	9.9	-0.5
CSN	115	2	10	2.0	0.3	115	0	8	0	7.6	0.0
CTM	27	0	0	0.8	-0.1	29	0	0	0	4.9	0.2
CUB	247	1	1	1.3	-0.3	230	0	6	0	9.7	-0.6
DAL	3590	0	40	1.4	0.1	3232	0	44	0	6.1	-0.2
DCE	64	0	6	1.7	0.4	65	0	11	0	11.4	-1.4
DHL	156	3	100	6.6	-6.5	95	1	67	0	11.0	3.1
DLH	1129	0	14	1.7	-0.2	1041	0	15	0	6.4	0.6
DRD	126	2	6	2.2	0.0	119	0	10	0	11.6	-2.2
DRI	36	0	3	1.4	0.2	33	0	6	0	7.0	0.5
EDW	61	0	2	1.3	0.0	46	0	2	0	9.3	-0.1
EEZ	107	5	20	2.8	1.2	105	0	8	0	7.2	-0.1
EIA	451	0	75	2.7	0.4	445	0	100	0	18.8	5.3
ELY	122	0	4	1.7	0.0	92	0	5	0	8.8	0.1
ETH	39	0	10	1.2	0.3	40	0	15	0	7.9	-0.2
EVA	130	2	4	1.4	0.1	139	0	2	0	5.8	-0.2
FCA	229	1	2	1.4	0.3	202	0	4	0	9.5	-0.6
FDX	1805	0	45	1.2	0.4	1667	0	46	0	6.3	0.1
FIN	390	0	5	1.8	0.0	297	0	4	0	5.7	0.5
FJI	797	3	32	1.7	0.9	779	0	29	0	7.9	0.7
FNY	33	0	12	1.0	-0.3	31	0	13	0	7.8	0.8
FOM	765	1	27	1.4	-0.2	761	0	27	0	7.1	0.6
FWI	630	1	3	1.5	-0.1	609	0	5	0	9.2	-0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GAF	33	0	6	2.0	-1.1	22	0	0	0	4.0	0.0
GCO	138	0	15	1.7	0.2	140	0	16	0	9.0	0.7
GES	39	3	5	2.0	-0.1	28	0	4	0	8.3	0.6
GHA	87	0	6	1.6	0.1	87	0	9	0	10.1	1.2
GRL	89	1	4	1.7	0.6	81	0	2	0	4.9	0.4
GTI	210	0	12	1.8	0.3	202	0	13	0	6.4	0.5
HAL	5203	0	42	1.4	0.4	5103	0	42	0	5.8	0.0
HXL	265	0	5	1.6	0.7	226	0	7	0	8.9	-0.5
IBE	3901	0	3	1.3	0.4	3867	0	6	0	8.8	-0.6
ICE	1255	0	4	1.5	-0.3	769	0	3	0	6.1	0.4
IWD	529	0	3	1.5	0.0	527	0	9	0	10.2	-0.3
JAL	2767	0	3	1.6	0.5	2702	0	4	0	7.8	-0.1
JAZ	604	1	3	1.3	0.8	599	0	3	0	7.3	-0.1
JBU	58	2	2	1.0	0.0	58	0	5	0	6.0	-0.3
KAL	2106	1	7	1.5	-0.1	2110	0	8	0	7.9	-0.2
KIW	51	2	35	0.9	-0.3	47	0	32	0	6.3	1.3
KLM	1605	0	3	1.6	0.0	1177	0	5	0	8.8	-0.4
LAN	498	0	2	1.7	-0.1	501	0	3	0	6.6	0.7
LAP	77	0	44	2.3	0.8	74	0	42	0	10.5	-1.4
LDI	414	0	3	1.6	0.2	353	0	4	0	9.3	-0.7
LNE	133	3	6	1.6	0.2	133	0	3	0	8.5	1.6
LOT	237	1	5	2.0	-0.5	159	0	5	0	7.8	-0.5
LTU	923	0	4	1.4	-0.1	781	0	5	0	7.2	0.0
LXR	41	2	5	1.9	-0.2	37	0	0	0	7.6	-1.2
MAS	346	0	4	1.7	0.1	341	1	4	0	6.5	-0.2
MMZ	70	0	7	1.7	0.6	74	1	14	0	10.2	-0.5
MON	71	0	3	1.6	0.1	49	0	2	0	5.3	1.1
MPD	514	0	3	1.5	0.4	486	0	3	0	7.7	-0.3
MPH	657	1	4	1.7	-0.9	509	0	3	0	7.3	-0.5
MXA	82	2	12	2.5	0.4	81	0	15	0	13.4	-1.8
MYT	367	1	7	2.0	0.5	296	0	5	0	8.6	0.1
NAO	525	0	37	1.0	0.1	525	0	37	0	5.6	-0.1
NCA	1110	0	4	1.8	0.1	817	0	6	0	7.4	0.1
NWA	7586	0	11	1.5	0.3	7458	0	12	0	7.4	0.0
NZL	3463	0	7	1.4	0.0	3463	0	7	0	5.2	0.4
OAE	643	0	37	1.1	-0.1	601	0	43	0	8.2	1.0
OOM	193	0	10	2.1	-1.4	121	0	12	0	5.4	0.3
PAC	441	1	14	1.4	-0.3	406	0	14	0	7.0	0.9
PAL	1565	0	11	1.4	0.1	1498	0	13	0	7.9	0.3
PAO	319	0	48	1.4	0.1	318	1	48	0	6.8	0.4
PBI	474	0	26	1.6	0.0	472	0	26	0	5.8	1.0
PLM	318	0	2	1.4	0.8	261	0	5	0	10.1	-0.2
PUA	62	2	66	2.7	-0.5	60	0	65	0	11.9	2.5
QFA	3643	0	49	1.3	0.3	3639	0	49	0	5.9	0.6
QQA	40	0	45	1.5	0.1	40	5	45	0	5.5	-0.7
RAM	388	0	6	1.9	0.6	284	0	9	0	12.2	-1.7
RCH	210	1	100	4.1	-2.0	182	0	100	0	16.1	0.6
RRR	162	2	11	2.0	-0.4	164	1	12	0	7.7	1.0
RYN	65	2	78	1.0	-0.6	63	0	46	0	7.7	-0.3
RZO	907	0	4	1.5	-0.6	842	0	7	0	11.1	-0.5
SAA	72	0	1	0.9	0.0	75	0	4	0	4.9	-0.2
SEU	204	0	3	1.4	0.3	188	0	4	0	8.7	-0.1
SIA	349	0	1	1.5	0.5	349	0	1	0	4.5	0.1
SLM	54	4	6	1.1	0.8	53	0	8	0	9.4	-0.1
SQC	40	0	5	1.7	0.2	40	0	5	0	5.5	0.7
SSV	40	3	8	2.2	-0.3	30	0	0	0	4.2	1.2
SVH	315	0	4	1.2	1.0	315	0	4	0	3.5	0.1
TAG	36	0	0	1.7	0.6	21	0	0	0	4.3	-0.2
TAM	82	5	44	2.9	-0.3	82	0	48	0	17.0	4.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

TAP	829	1	2	1.5	-0.4	757	0	4	0	8.9	-0.5
TCV	29	0	3	1.2	0.3	29	0	3	0	8.0	0.4
TCX	94	1	7	1.5	0.2	59	3	15	0	10.7	0.6
THA	203	0	3	1.5	-0.1	205	0	3	0	5.8	1.1
THT	385	2	24	1.1	0.5	372	0	24	0	5.6	0.4
TPA	47	0	0	1.1	0.2	42	0	7	0	14.1	-4.2
TPU	26	0	31	1.4	0.5	26	0	31	0	7.4	0.3
TSC	354	0	3	1.7	-0.4	241	0	3	0	6.9	0.8
UAE	485	0	6	1.5	0.4	486	0	6	0	5.8	0.2
UAL	186516	0	95	1.0	-0.1	186415	0	95	0	5.0	0.3
UPS	2053	1	57	1.6	0.1	2015	0	57	0	7.1	0.0
USA	57	5	5	1.0	0.6	56	0	5	0	6.5	-0.2
VHF	30	0	0	1.0	0.1	30	0	3	0	8.2	-1.2
VIR	223	1	7	1.9	-0.1	136	0	8	0	8.3	0.6
VPB	33	3	12	2.9	1.9	23	0	4	0	6.9	0.7
VRG	187	2	46	2.4	0.5	183	0	100	0	12.7	1.7
VVJ	38	0	5	1.8	-0.1	38	0	11	0	14.6	-1.8
VVR	160	0	41	1.9	1.0	160	0	40	0	5.4	0.5
WOA	406	0	6	1.4	0.1	358	0	11	0	9.0	0.4
XLA	150	0	5	1.2	0.2	147	0	6	0	7.3	0.3
YSS	37	0	3	1.6	0.9	37	0	8	0	11.1	-1.3

	TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	39056	1	10	1.2	0.6	39114	0	9	0	5.3	0.6
EU	199740	0	26	1.3	0.3	199737	0	25	0	4.4	0.2
HK	2998	0	23	1.3	0.3	2998	0	23	0	5.3	0.3
KL	1725	0	0	1.7	1.3	1725	0	1	0	7.4	-0.5
LN	20	0	45	3.5	-2.6	24	0	38	0	10.7	2.1
MK	2492	0	5	1.7	1.5	2447	0	5	0	7.9	2.3
SA	2556	0	7	1.3	0.3	2556	0	7	0	6.6	0.7
TN	94	0	18	1.6	0.7	83	0	19	0	5.1	0.0

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
N	1335	1	21	2.2	0.4	1055	0	24	0	7.2	0.5
US ACARS	907356	0	62	1.2	0.4	907350	0	62	0	5.4	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	419	0	29	1.1	-0.2	356	0	33	0	5.2	1.0
ACA	38	0	29	1.9	-0.4	34	0	24	0	7.1	1.0
AFP	21	0	14	3.6	-1.3	21	0	5	0	6.6	1.2
AFR	71	0	8	1.2	0.3	78	0	10	0	6.4	0.4
ANZ	245	2	25	1.6	-0.2	246	0	24	0	6.3	0.2
AXF	58	0	60	0.7	-0.1	57	0	60	0	8.0	1.6
AZA	31	0	3	1.4	-0.5	28	0	0	0	4.3	-0.2
CFC	45	2	9	1.4	0.6	38	3	11	0	7.0	1.2
CKS	65	3	8	2.1	0.8	48	0	8	0	10.4	0.3
DAL	167	0	40	1.4	0.0	151	0	44	0	6.9	-0.1
DLH	260	0	11	1.7	-0.1	261	0	13	0	7.7	0.7
EIA	54	4	87	1.3	0.2	51	0	100	0	18.4	3.6
FDX	698	0	23	1.4	0.2	550	0	22	0	6.8	0.5
FJI	20	0	40	3.0	1.2	20	0	35	0	7.5	1.5
FOM	30	7	43	0.8	-0.3	30	0	40	0	5.0	-0.6
GAF	85	1	2	1.1	0.0	37	0	5	0	6.9	1.4
GCO	46	0	9	1.3	0.0	48	0	10	0	6.3	0.8
GHA	27	4	4	1.1	0.0	26	0	12	0	11.9	4.3
HAL	178	2	42	1.7	-0.3	176	0	39	0	5.9	1.4
IBE	38	0	5	1.8	-0.2	39	0	8	0	12.2	-1.8
ICE	61	2	5	1.3	-0.6	33	0	3	0	5.5	0.8
JAL	65	0	2	1.7	0.5	65	0	0	0	6.3	1.3
JAZ	23	0	0	1.3	0.9	25	0	0	0	4.9	-0.3
KAL	80	3	21	1.8	-0.5	81	1	20	0	7.3	-0.9
KIW	26	12	42	2.6	0.2	26	0	31	0	7.1	2.7
KLM	43	0	2	1.8	0.7	30	0	3	0	6.4	1.2
LAN	34	3	6	1.9	-0.2	36	0	0	0	5.5	1.2
MAS	49	0	16	0.9	-0.4	50	0	18	0	5.6	0.8
MPH	52	0	0	1.5	-0.5	38	0	3	0	8.4	0.4
NCA	100	1	3	1.9	0.4	90	0	3	0	9.8	-1.1
NWA	414	1	8	1.6	0.2	399	0	8	0	7.4	-1.1
NZL	16864	0	53	1.2	0.3	16861	0	53	0	5.0	0.1
OAE	40	0	5	1.6	0.1	29	0	45	0	17.9	5.5
OCE	27	0	4	2.6	1.9	23	0	4	0	9.6	2.4
PAC	30	3	7	1.2	0.0	27	0	7	0	7.3	-0.8
PAL	21	0	19	0.7	-0.1	20	0	20	0	3.9	-0.3
QFA	389	0	48	1.5	-0.2	388	0	48	0	5.9	-0.3
RCH	30	0	100	2.9	0.4	26	0	100	0	16.1	-2.2
RRR	210	3	17	2.4	0.9	217	0	14	0	8.2	0.6
SIA	77	0	3	1.2	0.5	77	0	3	0	4.7	-0.1
SVH	14087	0	58	1.6	0.6	14087	0	58	0	4.3	0.7
UAE	100	0	4	1.0	0.3	100	0	6	0	5.4	-0.6
UAL	340655	0	99	1.1	-0.1	340405	0	99	0	4.2	0.3
UPS	247	1	51	1.1	-0.1	239	0	53	0	7.3	0.4
VVP	54	9	56	4.7	0.2	50	0	36	0	13.5	2.6
WOA	171	1	9	1.3	0.3	127	0	16	0	11.3	1.8

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	32934	0	49	1.2	0.5	33068	0	49	0	4.2	0.1
EU	611379	0	68	1.1	0.3	607040	0	68	0	3.7	0.0
HK	3240	0	73	1.2	0.2	3240	0	73	0	3.8	0.2
KL	545	0	59	1.5	0.2	545	0	59	0	4.3	-0.5
MK	2555	0	48	1.3	0.4	2510	0	48	0	4.6	0.8
SA	2700	0	54	1.3	0.2	2700	0	54	0	4.2	0.2
US ACARS	1636510	0	77	1.2	0.2	1631821	0	78	0	4.0	0.3

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 47863

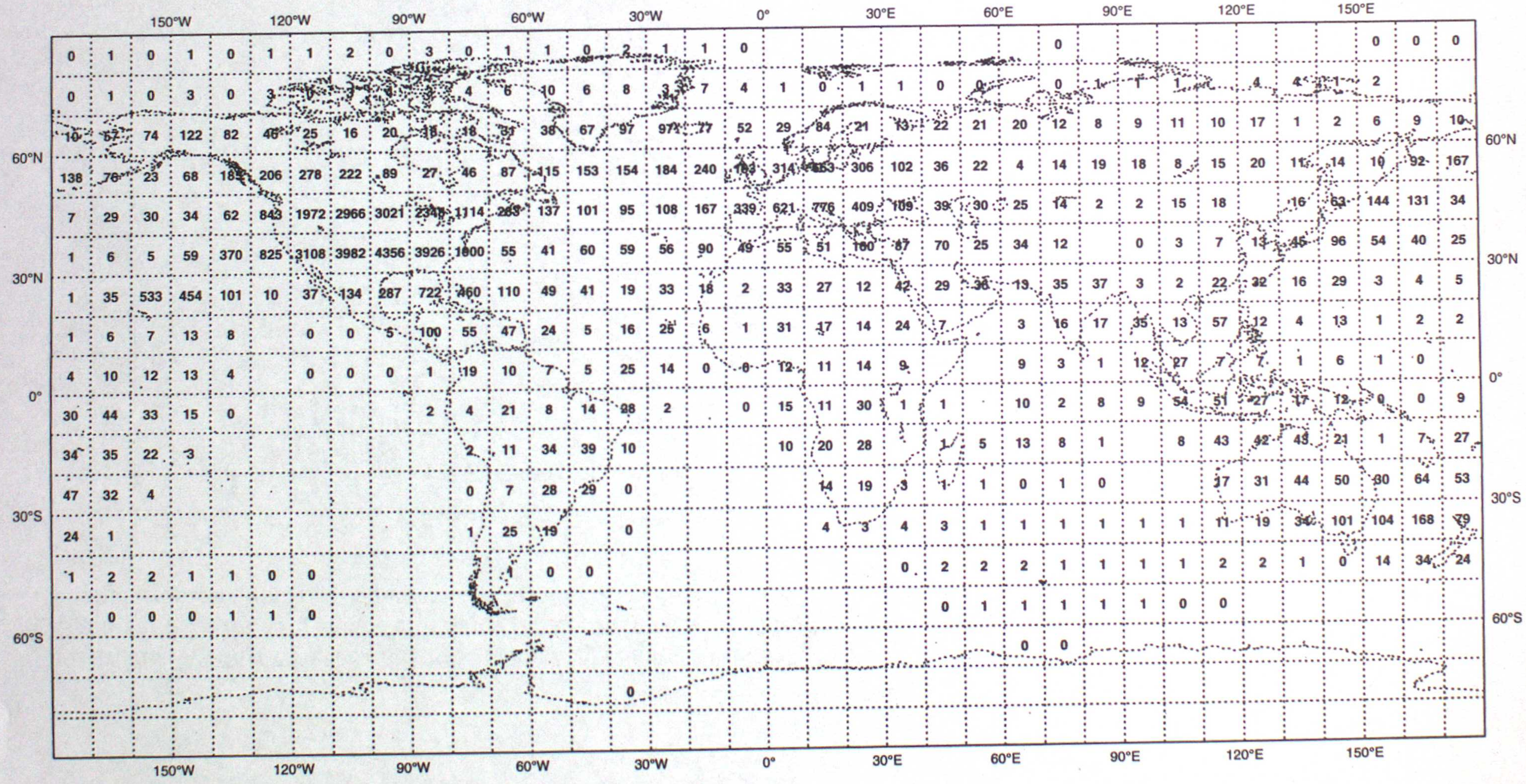

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 88568

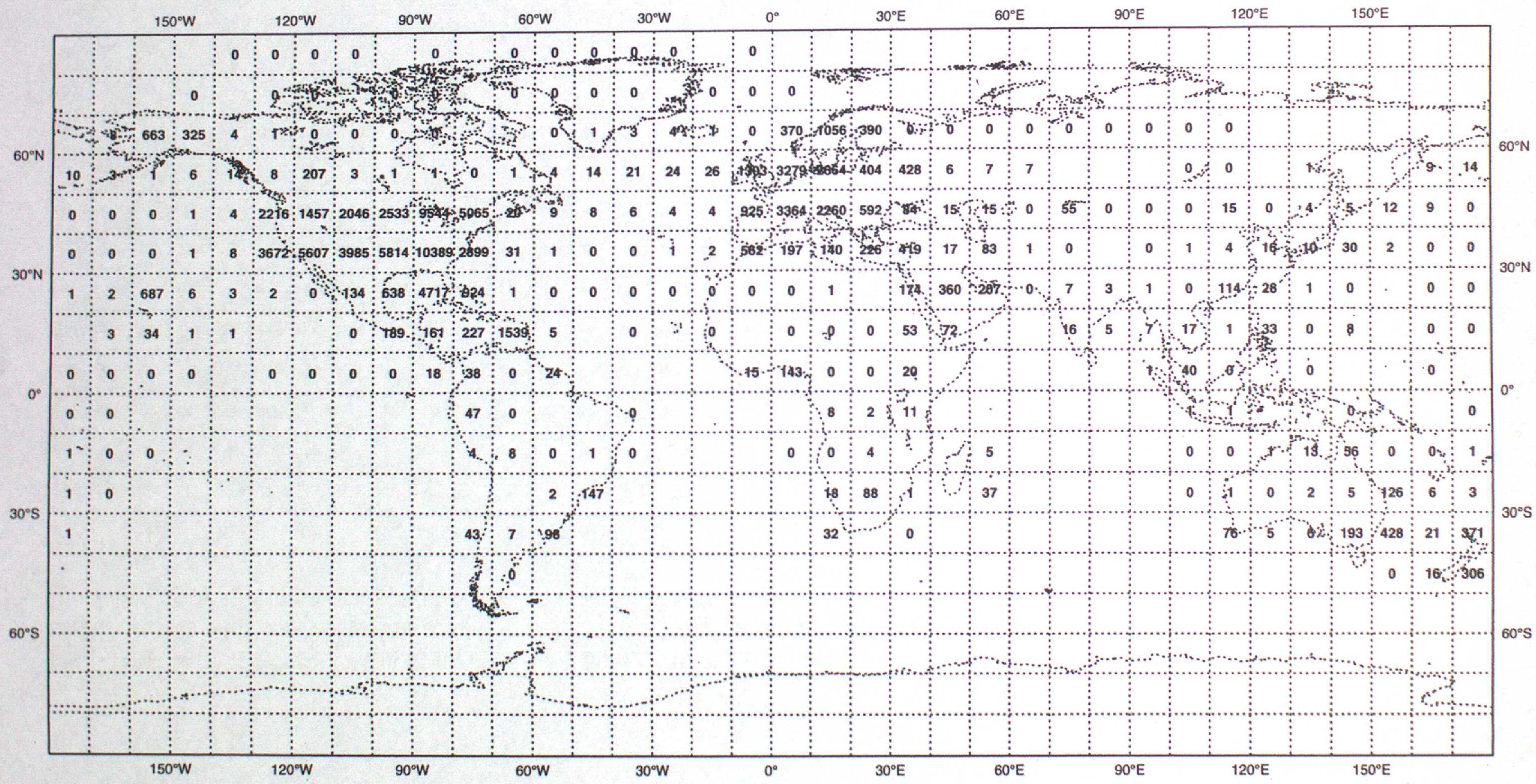

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0
3 663 325 4 1 0 0 0 0 1 3 4 1 0 370 1056 390 0 0 0 0 0 0 0 0 0 0
10 3 1 6 14 8 207 3 1 1 0 1 4 14 21 24 26 1303 3279 6664 404 428 6 7 7 0 0 1 9 14
0 0 0 1 4 2216 1457 2046 2533 9544 5065 20 9 8 6 4 4 925 3364 2260 592 84 15 15 0 55 0 0 0 15 0 4 5 12 9 0
0 0 0 1 8 3672 5607 3985 5814 10389 2899 31 1 0 0 1 2 582 197 140 226 419 17 83 1 0 0 1 4 16 10 30 2 0 0
1 2 687 6 3 2 0 134 638 4717 924 1 0 0 0 0 0 0 0 1 174 360 287 0 7 3 1 0 114 28 1 0 0 0
3 34 1 1 0 189 161 227 1539 5 0 0 0 0 0 53 72 16 5 7 17 1 33 0 8 0 0
0 0 0 0 0 0 0 0 18 38 0 24 15 143 0 0 20 1 40 0 0 0
0 0 47 0 0 8 2 11 1 1 0 0
1 0 0 4 8 0 1 0 0 0 4 5 0 0 1 13 56 0 0 1
1 0 2 147 18 88 1 37 0 1 0 2 5 126 6 3
1 43 7 96 32 0 76 5 6 193 428 21 371
0 0 16 306

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

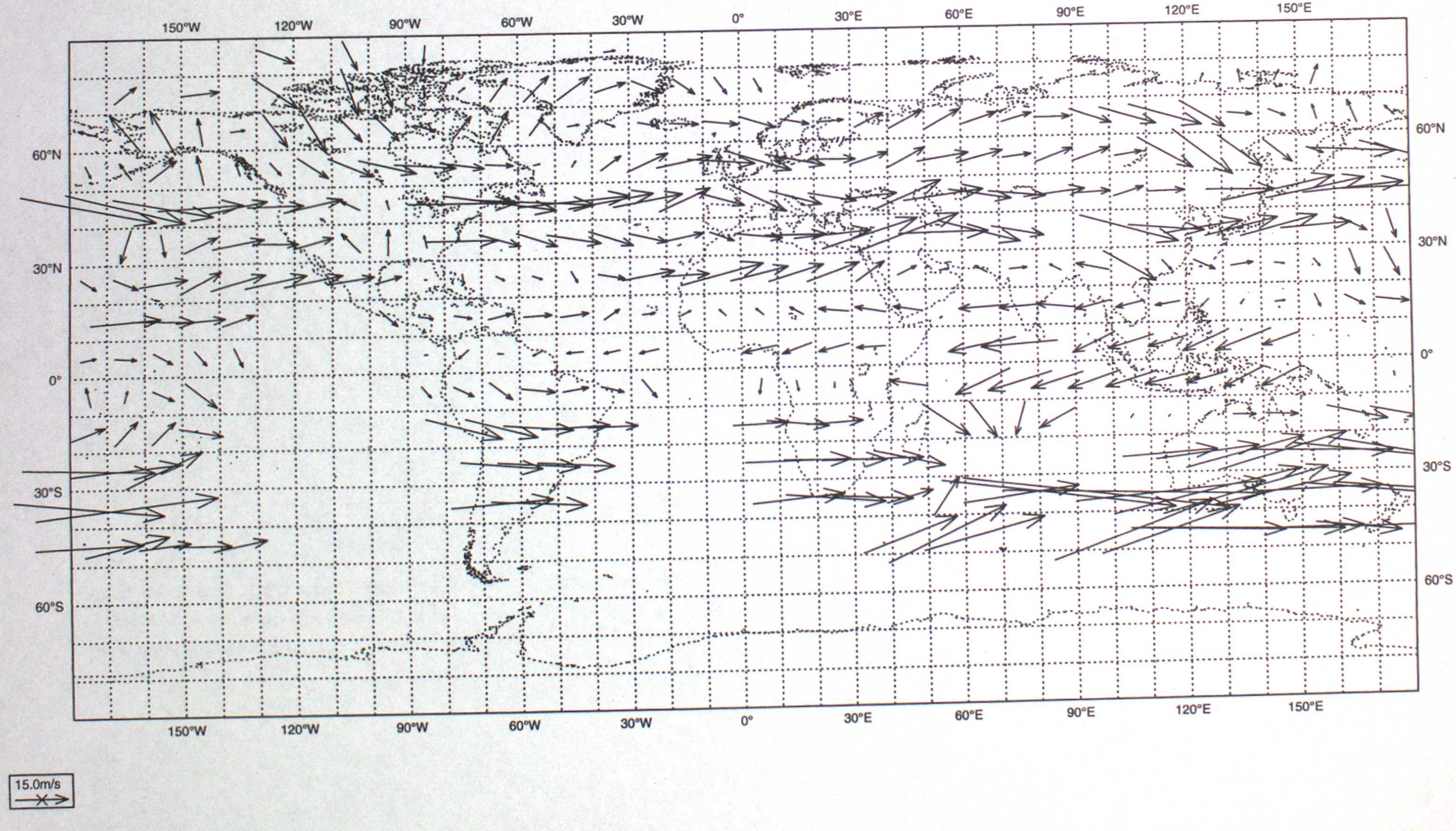

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

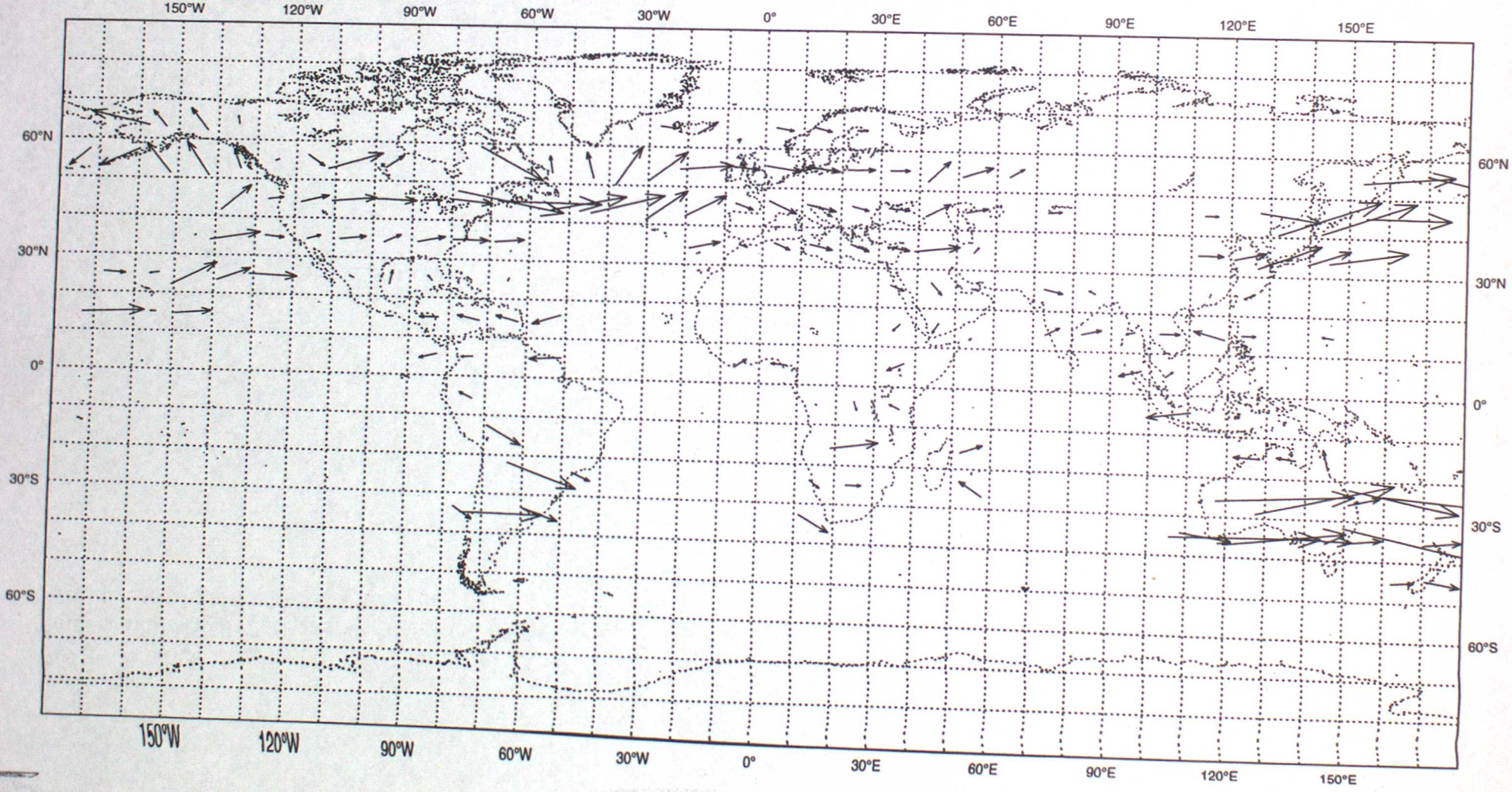

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

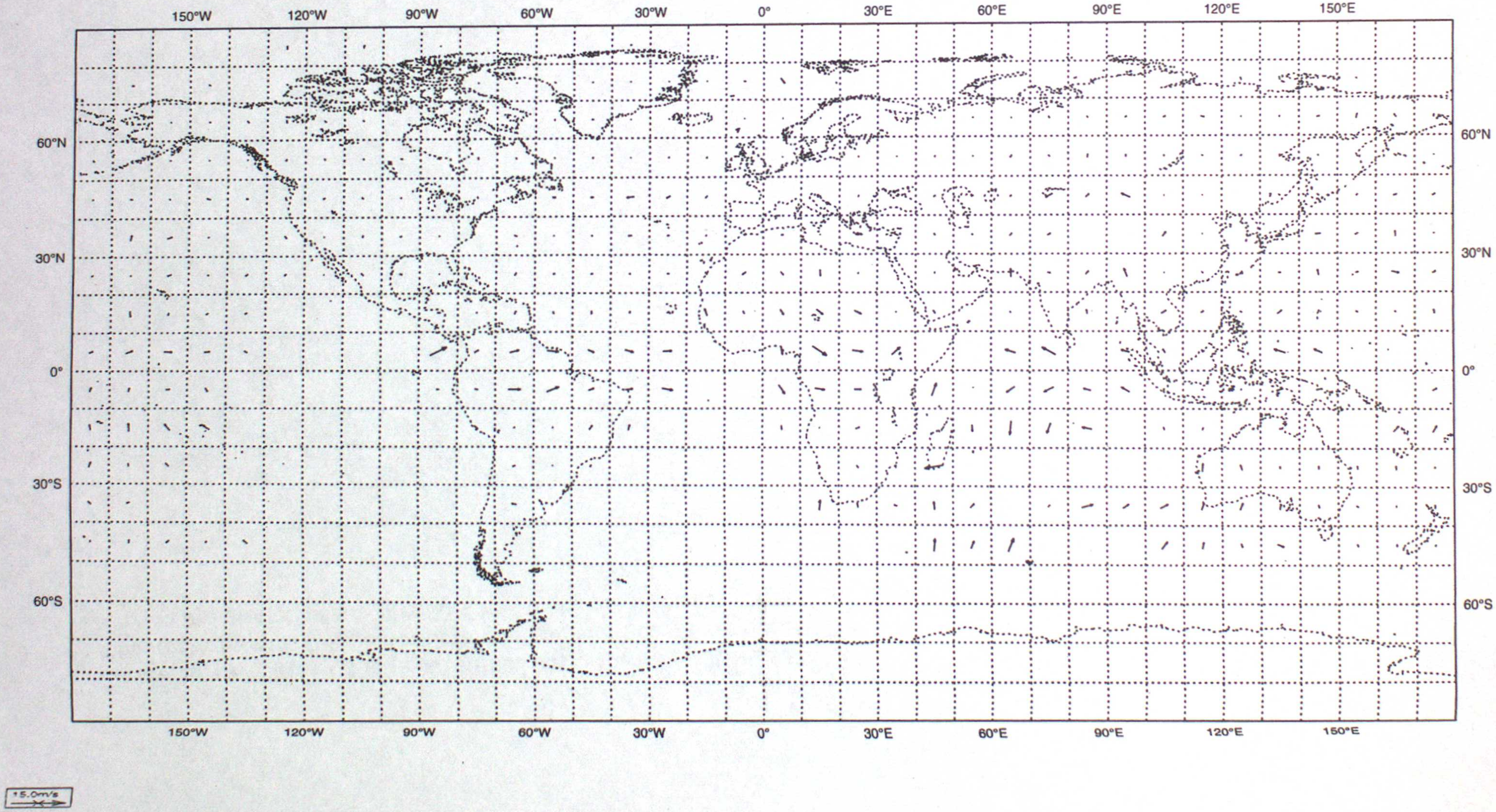

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

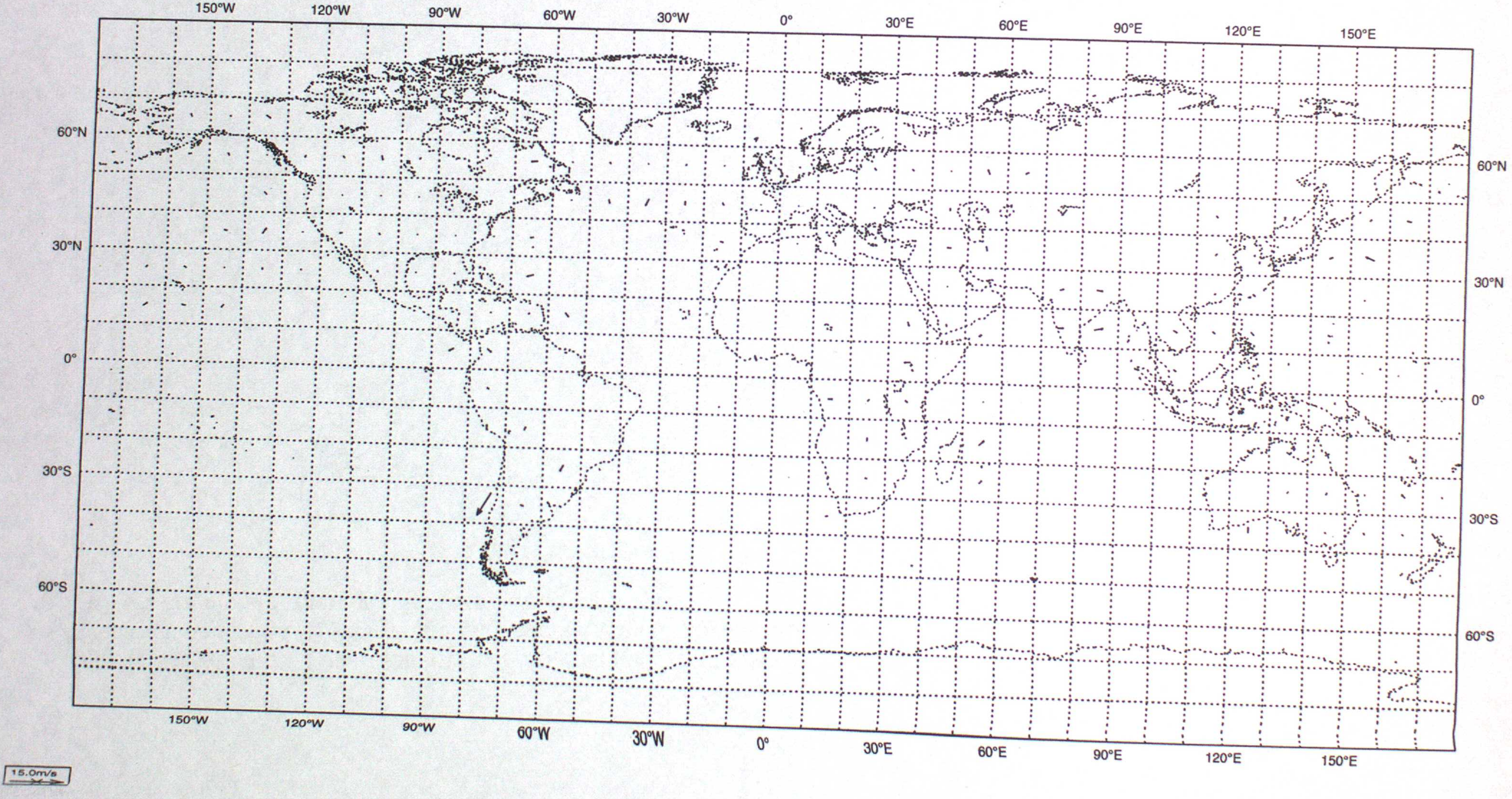

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

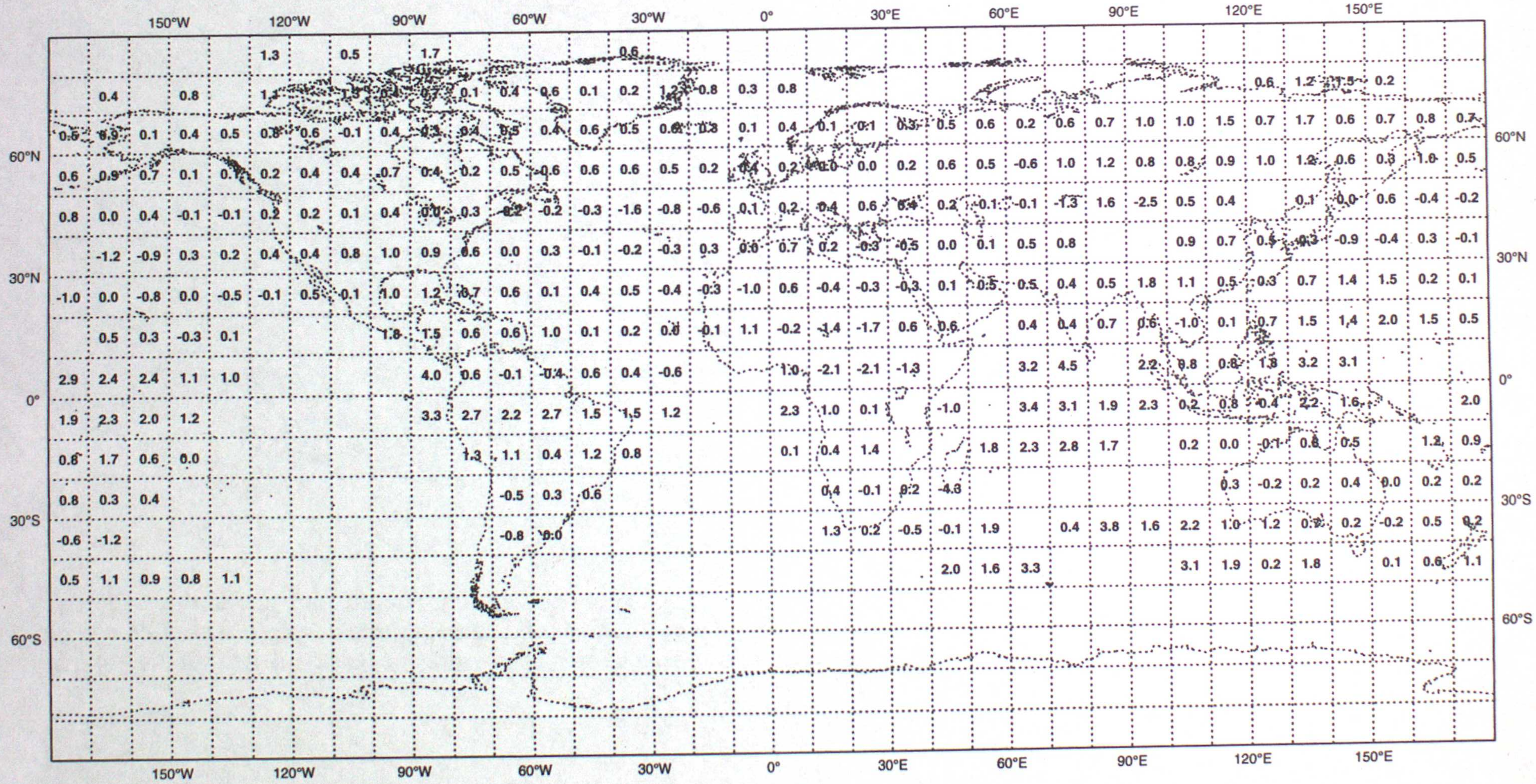

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.3 0.5 1.7 0.6
0.4 0.8 1.1 1.3 0.4 0.7 0.1 0.4 0.6 0.1 0.2 1.2 0.8 0.3 0.8 0.6 1.2 1.5 0.2
0.6 0.9 0.1 0.4 0.5 0.8 0.6 -0.1 0.4 0.3 0.4 0.5 0.4 0.6 0.5 0.6 0.3 0.1 0.4 0.1 0.1 0.3 0.5 0.6 0.2 0.6 0.7 1.0 1.0 1.5 0.7 1.7 0.6 0.7 0.8 0.7
0.6 0.9 0.7 0.1 0.1 0.2 0.4 0.4 0.7 0.4 0.2 0.5 0.6 0.6 0.6 0.5 0.2 0.4 0.2 0.0 0.0 0.2 0.6 0.5 -0.6 1.0 1.2 0.8 0.8 0.9 1.0 1.2 0.6 0.3 1.6 0.5
0.8 0.0 0.4 -0.1 -0.1 0.2 0.2 0.1 0.4 0.0 0.3 0.2 -0.2 -0.3 -1.6 -0.8 -0.6 0.1 0.2 0.4 0.6 0.4 0.2 -0.1 -0.1 -1.3 1.6 -2.5 0.5 0.4 0.1 0.0 0.6 -0.4 -0.2
-1.2 -0.9 0.3 0.2 0.4 0.4 0.8 1.0 0.9 0.6 0.0 0.3 -0.1 -0.2 -0.3 0.3 0.0 0.7 0.2 -0.3 -0.5 0.0 0.1 0.5 0.8 0.9 0.7 0.5 0.3 -0.9 -0.4 0.3 -0.1
-1.0 0.0 -0.8 0.0 -0.5 -0.1 0.5 0.1 1.0 1.2 0.7 0.6 0.1 0.4 0.5 -0.4 -0.3 -1.0 0.6 -0.4 -0.3 -0.3 0.1 0.5 0.5 0.4 0.5 1.8 1.1 0.5 0.3 0.7 1.4 1.5 0.2 0.1
0.5 0.3 -0.3 0.1 1.8 1.5 0.6 0.6 1.0 0.1 0.2 0.0 0.1 1.1 -0.2 1.4 -1.7 0.6 0.6 0.4 0.4 0.7 0.6 -1.0 0.1 0.7 1.5 1.4 2.0 1.5 0.5
2.9 2.4 2.4 1.1 1.0 4.0 0.6 -0.1 -0.4 0.6 0.4 -0.6 1.0 -2.1 -2.1 -1.3 3.2 4.5 2.2 0.8 0.8 1.3 3.2 3.1
1.9 2.3 2.0 1.2 3.3 2.7 2.2 2.7 1.5 1.5 1.2 2.3 1.0 0.1 -1.0 3.4 3.1 1.9 2.3 0.2 0.8 -0.4 2.2 1.6 2.0
0.6 1.7 0.6 0.0 1.3 1.1 0.4 1.2 0.8 0.1 0.4 1.4 1.8 2.3 2.8 1.7 0.2 0.0 -0.1 0.8 0.5 1.2 0.9
0.8 0.3 0.4 -0.5 0.3 0.6 0.4 -0.1 0.2 -4.3 0.3 -0.2 0.2 0.4 0.0 0.2 0.2
-0.6 -1.2 -0.8 0.0 1.3 0.2 -0.5 -0.1 1.9 0.4 3.8 1.6 2.2 1.0 1.2 0.2 0.2 -0.2 0.5 0.2
0.5 1.1 0.9 0.8 1.1 2.0 1.6 3.3 3.1 1.9 0.2 1.8 0.1 0.6 1.1

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

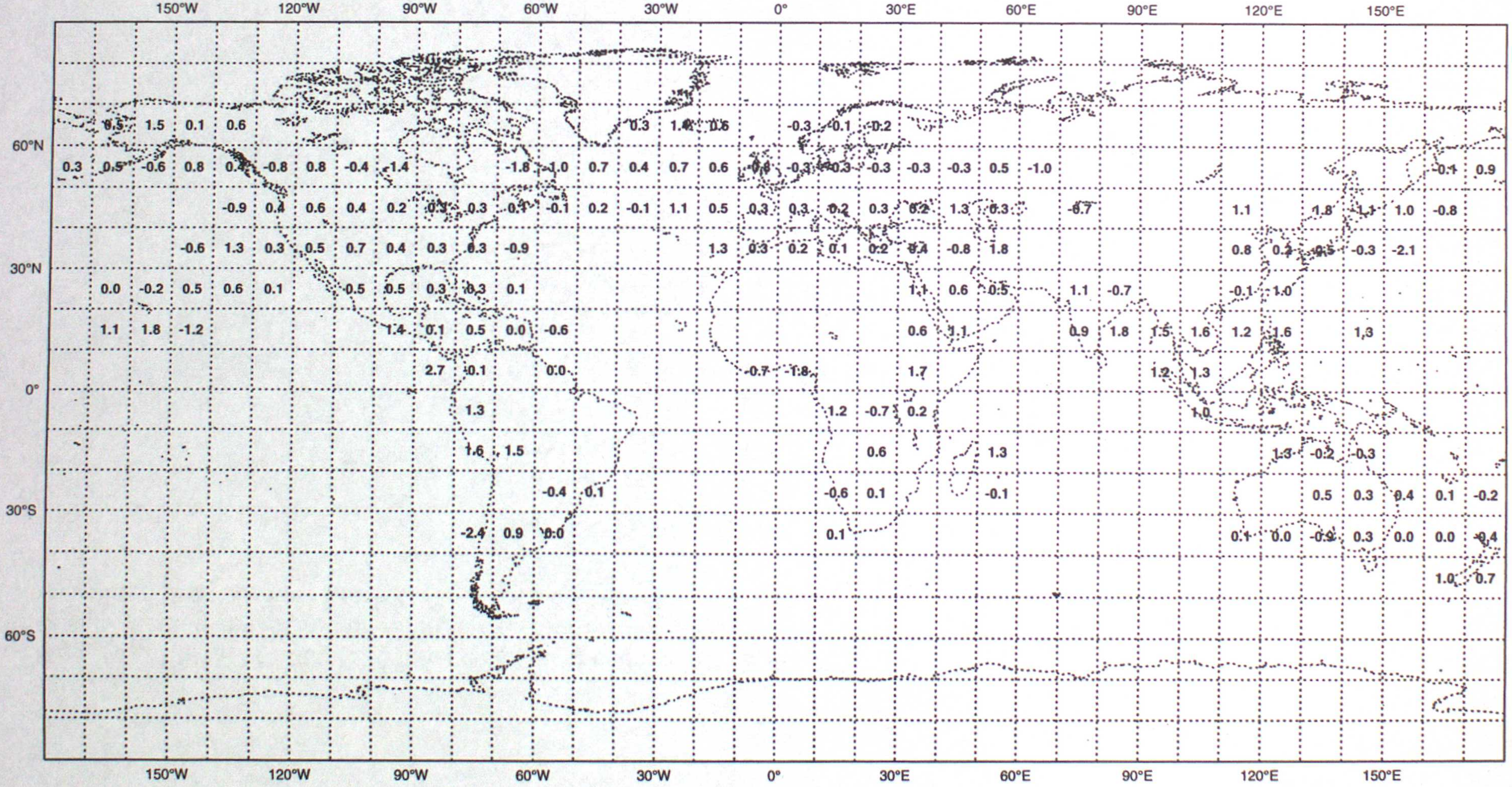

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.5 1.5 0.1 0.6 0.3 1.4 0.6 -0.3 -0.1 -0.2
0.3 0.5 -0.6 0.8 0.4 -0.8 0.8 -0.4 -1.4 -1.8 -1.0 0.7 0.4 0.7 0.6 -0.8 -0.3 -0.3 -0.3 -0.3 -0.3 0.5 -1.0 -0.1 0.9
-0.9 0.4 0.6 0.4 0.2 0.3 -0.3 -0.1 -0.1 0.2 -0.1 1.1 0.5 0.3 0.3 0.2 0.3 0.2 1.3 0.3 -0.7 1.1 1.8 1.1 1.0 -0.8
-0.6 1.3 0.3 0.5 0.7 0.4 0.3 0.3 -0.9 1.3 0.3 0.2 0.1 0.2 0.4 -0.8 1.8 0.8 0.2 0.5 -0.3 -2.1
0.0 -0.2 0.5 0.6 0.1 0.5 0.5 0.3 0.3 0.1 1.1 0.6 0.5 1.1 -0.7 -0.1 1.0
1.1 1.8 -1.2 1.4 0.1 0.5 0.0 -0.6 0.6 1.1 0.9 1.8 1.5 1.6 1.2 1.6 1.3
2.7 0.1 0.0 -0.7 -1.8 1.7 1.2 1.3
1.3 1.2 -0.7 0.2 1.0
1.6 1.5 0.6 1.3 1.3 -0.2 -0.3
-0.4 0.1 -0.6 0.1 -0.1 0.5 0.3 0.4 0.1 -0.2
-2.4 0.9 0.0 0.1 0.1 0.0 -0.9 0.3 0.0 0.0 -0.4
1.0 0.7

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

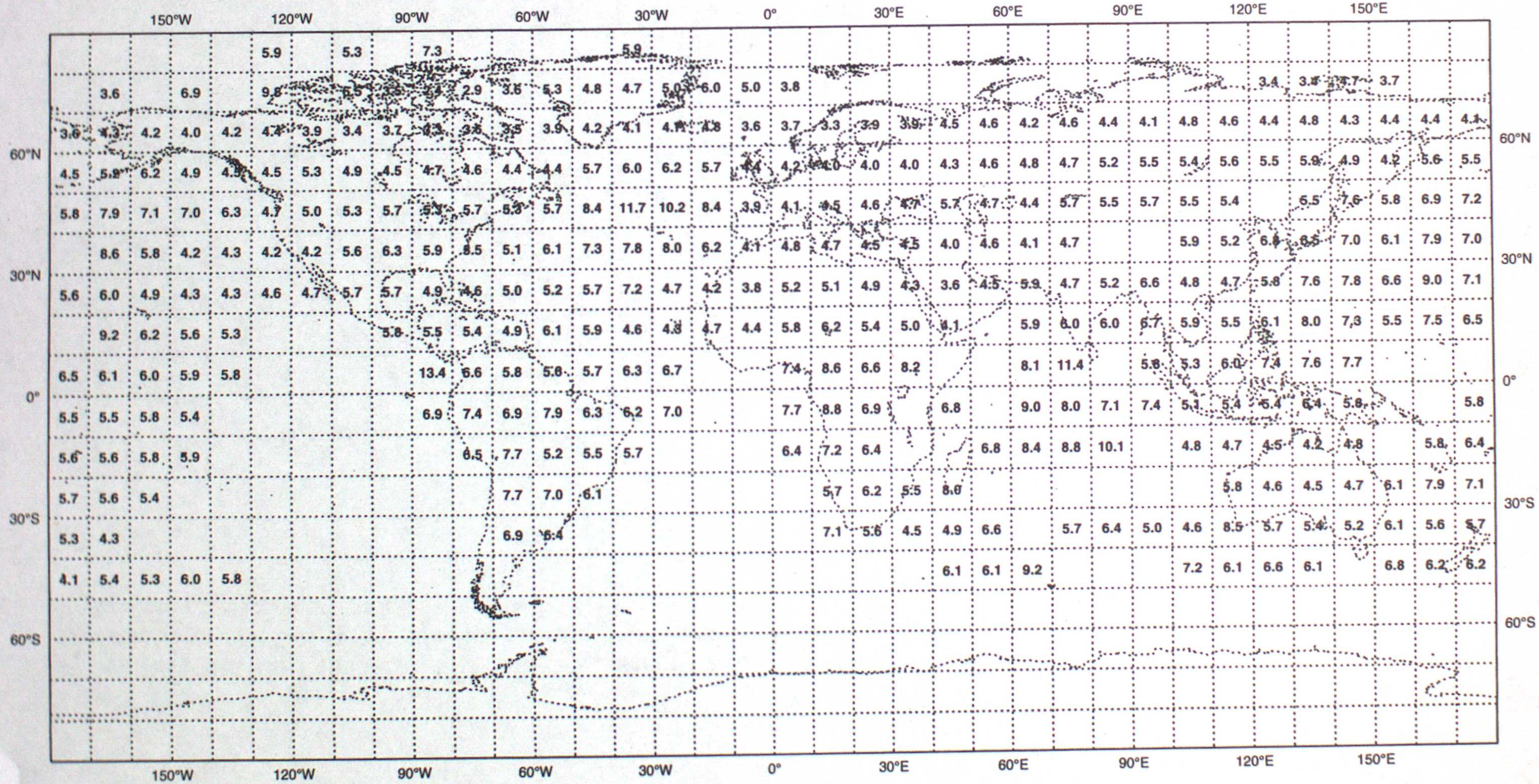
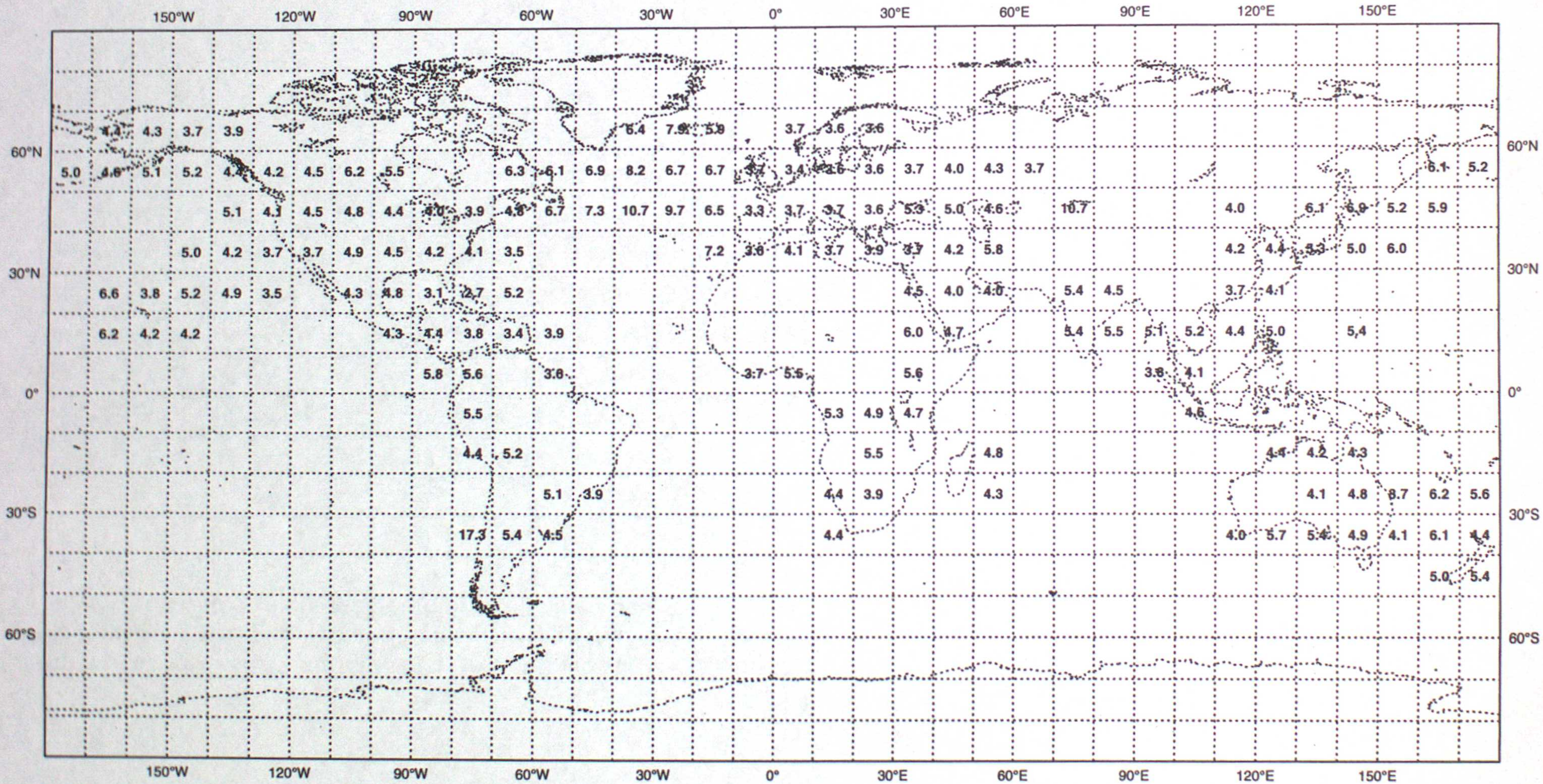

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
5.9 5.3 7.3 5.9
3.6 6.9 9.8 2.9 3.6 5.3 4.8 4.7 5.0 6.0 5.0 3.8 3.4 3.4 3.7 3.7
3.6 4.3 4.2 4.0 4.2 4.7 3.9 3.4 3.7 4.3 3.6 3.5 3.9 4.2 4.1 4.1 4.8 3.6 3.7 3.3 3.9 3.9 4.5 4.6 4.2 4.6 4.4 4.1 4.8 4.6 4.4 4.8 4.3 4.4 4.4 4.1
4.5 5.9 6.2 4.9 4.3 4.5 5.3 4.9 4.5 4.7 4.6 4.4 4.4 5.7 6.0 6.2 5.7 4.4 4.2 4.0 4.0 4.0 4.3 4.6 4.8 4.7 5.2 5.5 5.4 5.6 5.5 5.9 4.9 4.2 5.6 5.5
5.8 7.9 7.1 7.0 6.3 4.7 5.0 5.3 5.7 5.3 5.7 5.3 5.7 8.4 11.7 10.2 8.4 3.9 4.1 4.5 4.6 4.7 5.7 4.7 4.4 5.7 5.5 5.7 5.5 5.4 6.5 7.6 5.8 6.9 7.2
8.6 5.8 4.2 4.3 4.2 4.2 5.6 6.3 5.9 8.5 5.1 6.1 7.3 7.8 8.0 6.2 4.1 4.8 4.7 4.5 4.5 4.0 4.6 4.1 4.7 5.9 5.2 6.8 6.5 7.0 6.1 7.9 7.0
5.6 6.0 4.9 4.3 4.3 4.6 4.7 5.7 5.7 4.9 4.6 5.0 5.2 5.7 7.2 4.7 4.2 3.8 5.2 5.1 4.9 4.3 3.6 4.5 5.9 4.7 5.2 6.6 4.8 4.7 5.8 7.6 7.8 6.6 9.0 7.1
9.2 6.2 5.6 5.3 5.8 5.5 5.4 4.9 6.1 5.9 4.6 4.8 4.7 4.4 5.8 6.2 5.4 5.0 4.1 5.9 6.0 6.0 6.7 5.9 5.5 6.1 8.0 7.3 5.5 7.5 6.5
6.5 6.1 6.0 5.9 5.8 13.4 6.6 5.8 5.8 5.7 6.3 6.7 7.4 8.6 6.6 8.2 8.1 11.4 5.8 5.3 6.0 7.4 7.6 7.7
5.5 5.5 5.8 5.4 6.9 7.4 6.9 7.9 6.3 6.2 7.0 7.7 8.8 6.9 6.8 9.0 8.0 7.1 7.4 5.1 5.4 5.4 6.4 5.6 5.8
5.6 5.6 5.8 5.9 6.5 7.7 5.2 5.5 5.7 6.4 7.2 6.4 6.8 8.4 8.8 10.1 4.8 4.7 4.5 4.2 4.8 5.8 6.4
5.7 5.6 5.4 7.7 7.0 6.1 5.7 6.2 5.5 8.0 5.8 4.6 4.5 4.7 6.1 7.9 7.1
5.3 4.3 6.9 6.4 7.1 5.6 4.5 4.9 6.6 5.7 6.4 5.0 4.6 8.5 5.7 5.4 5.2 6.1 5.6 5.7
4.1 5.4 5.3 6.0 5.8 6.1 6.1 9.2 7.2 6.1 6.6 6.1 6.8 6.2 6.2

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). JUNE 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present


150°W
120°W
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30°E
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90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.4 4.3 3.7 3.9 6.4 7.9 5.9 3.7 3.6 3.6
5.0 4.6 5.1 5.2 4.4 4.2 4.5 6.2 5.5 6.3 6.1 6.9 8.2 6.7 6.7 3.7 3.4 3.6 3.6 3.7 4.0 4.3 3.7 6.1 5.2
5.1 4.1 4.5 4.8 4.4 4.0 3.9 4.8 6.7 7.3 10.7 9.7 6.5 3.3 3.7 3.7 3.6 5.3 5.0 4.6 10.7 4.0 6.1 6.9 5.2 5.9
5.0 4.2 3.7 3.7 4.9 4.5 4.2 4.1 3.5 7.2 3.6 4.1 3.7 3.9 3.7 4.2 5.8 4.2 4.4 5.3 5.0 6.0
6.6 3.8 5.2 4.9 3.5 4.3 4.8 3.1 2.7 5.2 4.5 4.0 4.0 5.4 4.5 3.7 4.1
6.2 4.2 4.2 4.3 4.4 3.8 3.4 3.9 6.0 4.7 5.4 5.5 5.1 5.2 4.4 5.0 5.4
5.8 5.6 3.8 3.7 5.5 5.6 3.8 4.1
5.5 5.3 4.9 4.7 4.6
4.4 5.2 5.5 4.8 4.4 4.2 4.3
5.1 3.9 4.4 3.9 4.3 4.1 4.8 8.7 6.2 5.6
17.3 5.4 4.5 4.4 4.0 5.7 5.4 4.9 4.1 6.1 4.4
5.0 5.4

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
42027	00	Z	500	34/ 75	14	0	47.0	-18.1	50.4	4
42027	12	Z	200	34/ 75	10	0	90.7	-21.5	93.2	4
42101	00	Z	70	30/ 76	15	0	143.8	63.3	157.1	8
42101	12	Z	50	30/ 76	11	1	117.9	154.0	193.9	6
42182	00	Z	70	29/ 77	12	2	174.4	160.4	237.0	9
42182	12	Z	850	29/ 77	29	0	28.3	32.8	43.3	11
42339	00	Z	500	26/ 73	20	0	32.7	-64.1	72.0	7
42339	12	Z	300	26/ 73	18	0	77.0	-41.1	87.3	8
42361	00	Z	70	26/ 78	12	1	149.9	113.1	187.8	4
42361	12	Z	200	26/ 78	18	0	113.2	31.1	117.4	7
42369	00	Z	1000	27/ 81	2	21	6.0	-53.0	53.3	11
42369	12	Z	1000	27/ 81	2	26	12.0	-62.0	63.2	10
42379	00	Z	300	27/ 83	16	1	69.5	-67.1	96.6	8
42379	12	Z	1000	27/ 83	22	0	19.3	-47.4	51.2	8
42397	00	Z	150	27/ 88	12	0	95.1	24.8	98.3	6
42397	12	Z	250	27/ 88	15	0	80.3	-5.5	80.5	4
42410	00	Z	70	26/ 92	15	1	124.1	164.9	206.4	10
42492	12	Z	1000	26/ 85	17	11	11.1	-79.2	79.9	6
42647	00	Z	1000	23/ 73	18	2	24.6	-50.1	55.8	6
42647	12	Z	1000	23/ 73	21	4	16.2	-57.7	59.9	6
42667	12	Z	250	23/ 77	10	1	96.3	2.8	96.3	5
42701	00	Z	100	23/ 85	15	1	117.4	35.4	122.6	5
42701	12	Z	70	23/ 85	11	0	202.6	46.8	207.9	9
42809	12	Z	1000	23/ 88	29	0	16.2	-32.3	36.1	5
42867	00	Z	200	21/ 79	17	1	99.7	-98.0	139.8	9
42867	12	Z	100	21/ 79	13	1	163.1	-96.9	189.7	8
42874	00	Z	200	21/ 82	15	0	116.7	-14.7	117.6	6
42874	12	Z	500	21/ 82	23	0	48.8	-48.8	69.0	6
42971	12	Z	1000	20/ 86	21	5	12.7	-65.6	66.8	8
43003	12	Z	1000	19/ 73	14	16	11.2	-85.9	86.6	10
43014	00	Z	200	20/ 75	11	2	101.2	40.2	108.9	4
43014	12	Z	250	20/ 75	21	1	107.0	27.0	110.3	6
43128	00	Z	200	17/ 78	22	0	96.9	-20.6	99.1	8
43128	12	Z	850	17/ 78	13	0	31.1	29.3	42.7	9
43150	12	Z	150	18/ 83	10	0	137.4	26.1	139.8	7
43185	00	Z	150	16/ 81	22	0	106.6	-48.4	117.1	4
43185	12	Z	100	16/ 81	13	0	135.9	-38.2	141.2	5
43192	00	Z	250	15/ 74	14	0	58.9	-59.9	84.0	5
43192	12	Z	1000	15/ 74	1	25	0.0	-99.0	99.0	8
43279	00	Z	1000	13/ 80	26	0	31.8	-17.0	36.1	11
43279	12	Z	1000	13/ 80	26	0	23.1	-46.2	51.7	7
43285	00	Z	200	13/ 75	20	0	80.2	-61.9	101.4	5
43346	00	Z	150	11/ 80	12	0	82.8	100.0	129.8	6
43346	12	Z	150	11/ 80	16	0	97.3	80.6	126.3	9
43353	00	Z	1000	10/ 76	24	1	12.2	-76.4	77.3	5
43369	12	Z	200	8/ 73	11	0	99.5	9.9	100.0	4
43371	00	Z	30	8/ 77	10	1	202.0	-63.7	211.8	8
43371	12	Z	50	8/ 77	17	1	160.4	111.0	195.1	8
43466	12	Z	300	7/ 80	8	0	79.3	21.5	82.2	4
58968	00	Z	1000	25/ 122	8	19	12.0	-82.8	83.6	4
72280	12	Z	1000	33/-115	6	4	13.3	-73.5	74.7	4
84378	12	Z	1000	-4/ -73	11	0	11.8	40.7	42.4	5

Figure 8. TEMP 500 hPa geopotential mean daily count. JUNE 2004
All hours
Global average number of observations in 24 hours = 1166

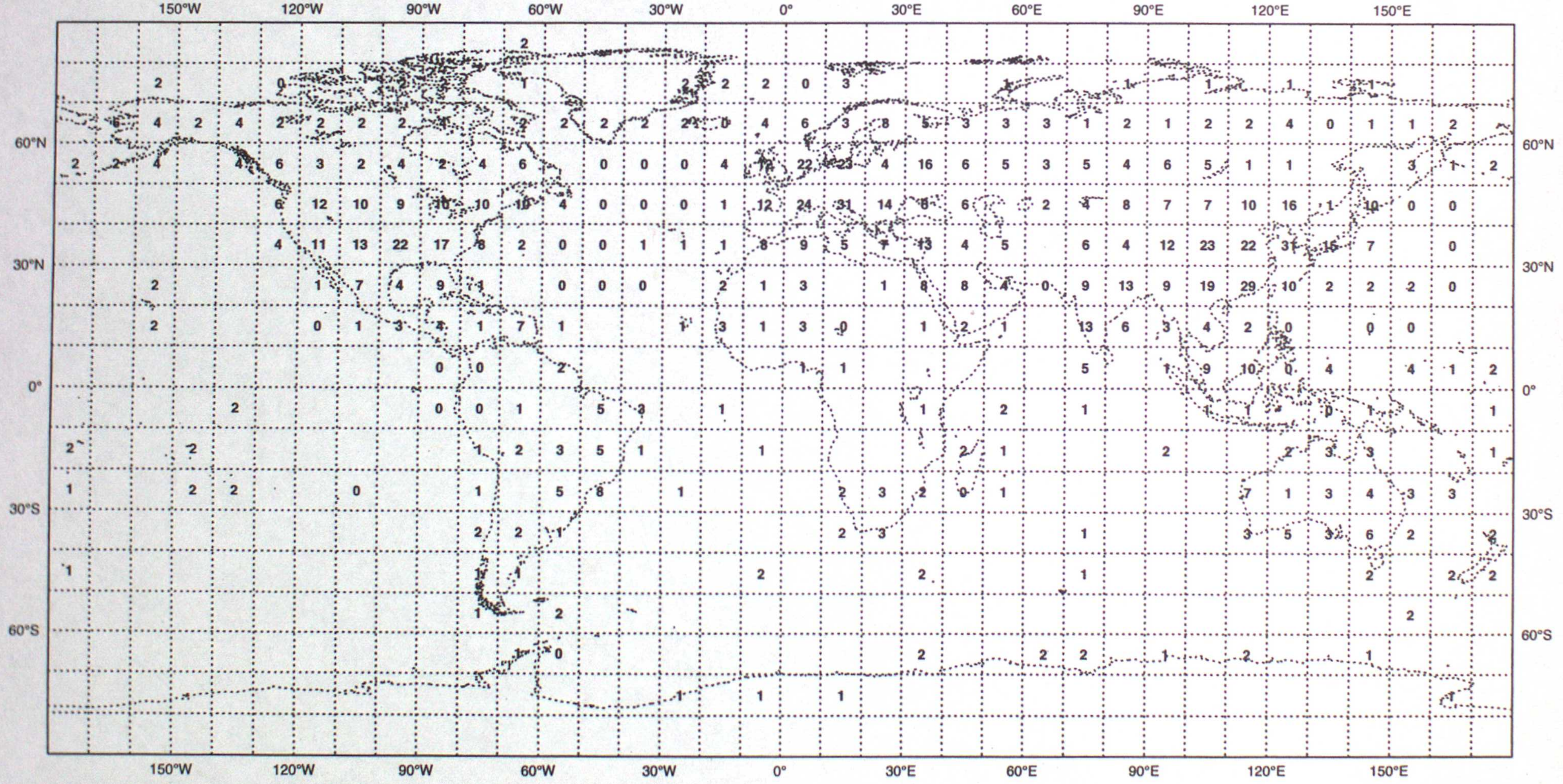

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
07761	12	V	300	42/ 9	29	0	10	-2.1	4.7	17.5	1
43369	00	V	300	8/ 73	17	1	17	-1.3	2.4	19.1	3
43369	12	V	250	8/ 73	10	1	10	-2.9	5.4	17.6	1
60559	12	V	300	33/ 7	14	0	100	-4.1	4.8	18.4	1
60566	12	V	150	32/ 4	10	0	100	-12.3	-5.9	18.5	2
63741	00	V	150	-1/ 37	25	0	28	8.7	0.9	16.4	1
68174	12	V	200	-24/ 29	10	0	100	-6.3	-4.1	18.9	2
68263	12	V	200	-26/ 28	10	0	100	-9.5	-6.2	30.1	5
68442	12	V	300	-29/ 26	18	0	100	-14.2	-2.4	18.7	3
68461	12	V	200	-28/ 28	13	0	100	-9.0	8.9	21.9	2
68588	12	V	200	-30/ 31	10	1	100	12.8	3.5	21.8	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. JUNE 2004
All hours
Global average number of observations in 24 hours = 1319

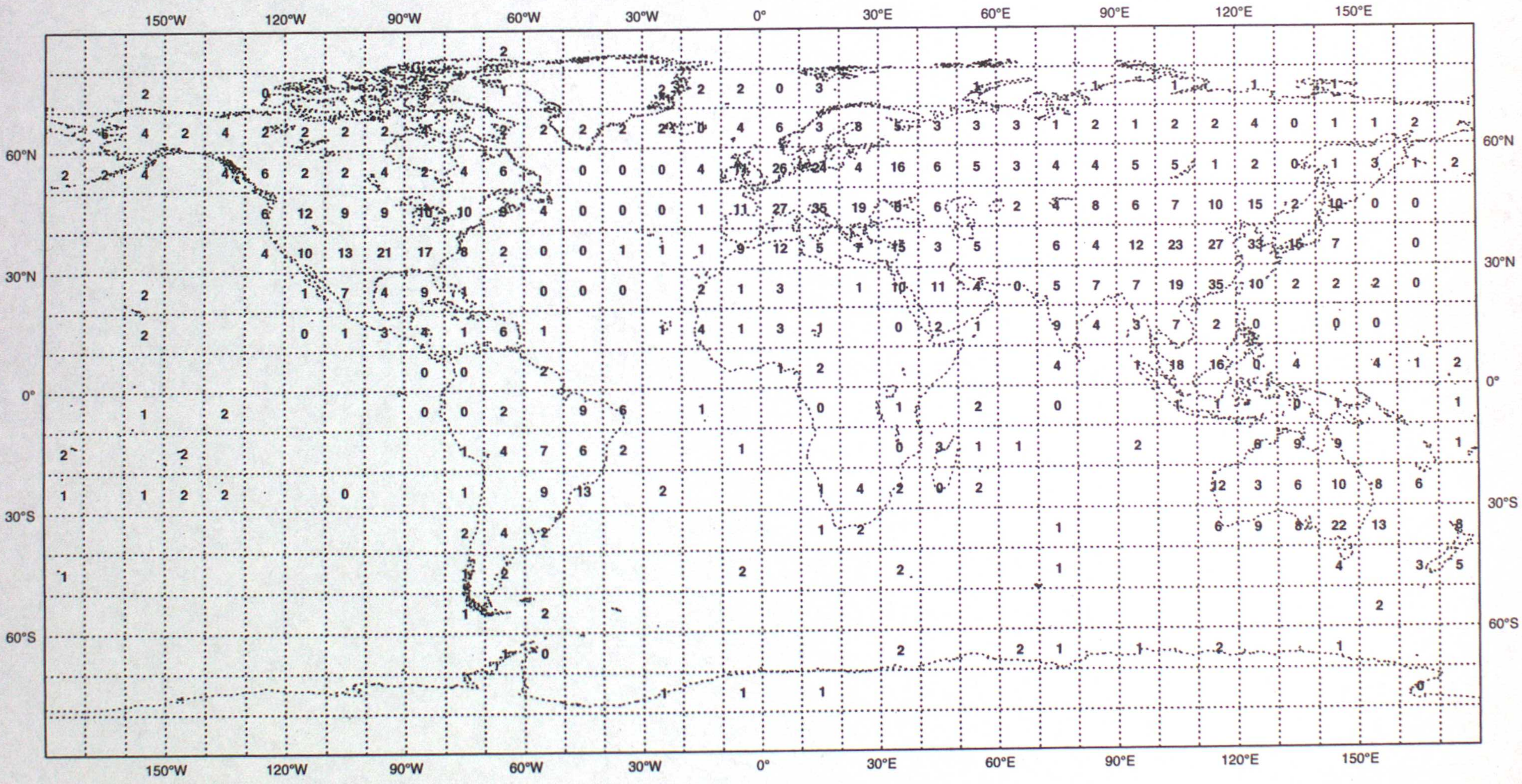

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
ELML7	12	DD	47/ -15	5	-14.7	6.7	20.4
08594	12	DD	17/ -23	15	-11.5	4.4	18.0
33791	12	DD	48/ 33	21	-13.0	2.8	8.9
42379	12	DD	27/ 83	9	27.3	9.4	20.6
62337	00	DD	31/ 34	27	-19.5	1.9	7.4
72786	00	DD	48/-118	25	18.9	4.7	12.6
72786	12	DD	48/-118	26	18.7	3.8	11.3
78954	12	DD	13/ -59	16	-12.7	4.4	16.0
96481	00	DD	4/ 118	16	10.3	7.6	22.8

Figure 11. SATOB 701 - 1000 hPa vector mean wind. JUNE 2004
All observations
Arrows are plotted where greater than 10 obs are present

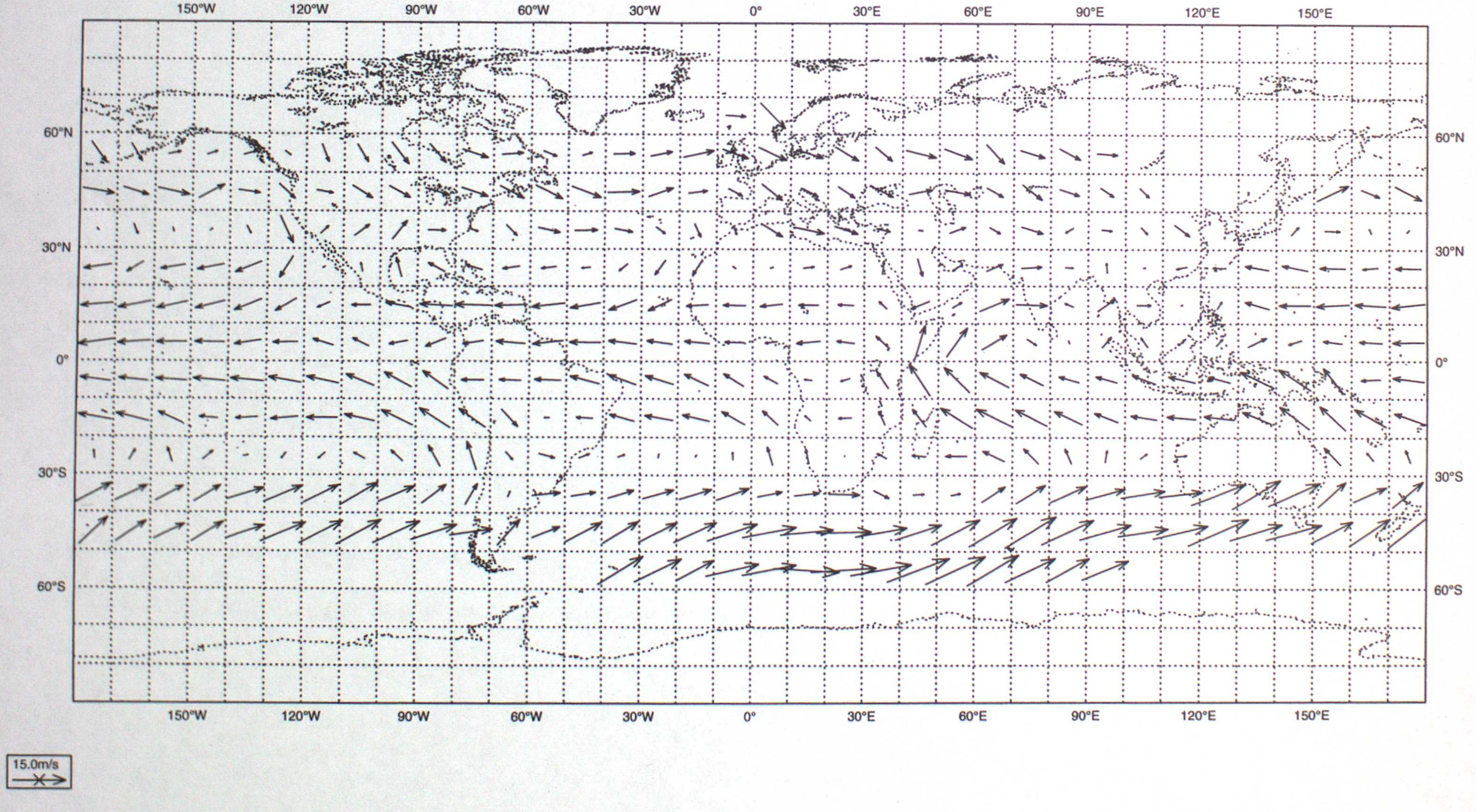

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. JUNE 2004
All observations
Arrows are plotted where greater than 10 obs are present

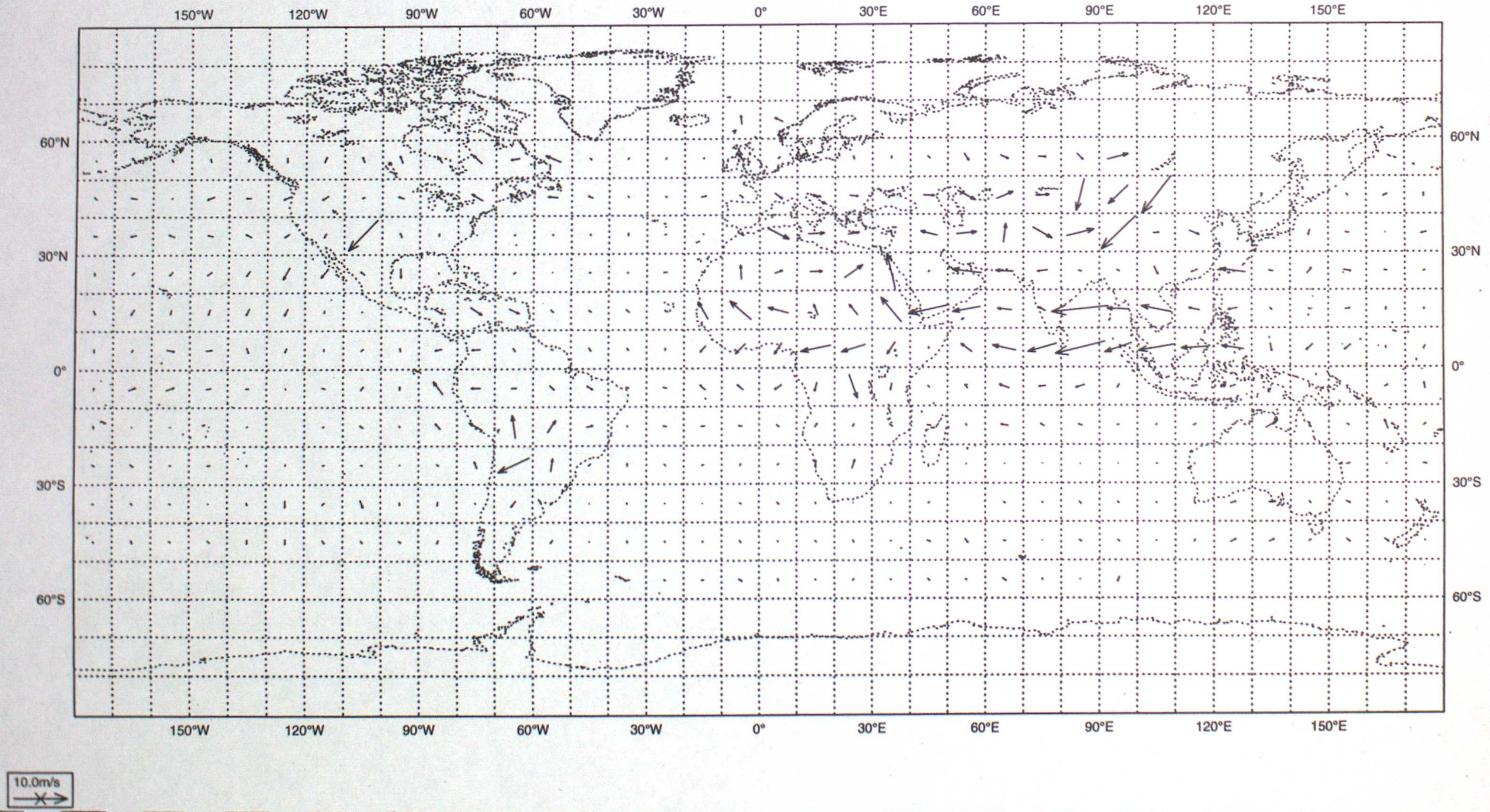

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). JUNE 2004
All observations
Values are plotted where greater than 10 obs are present

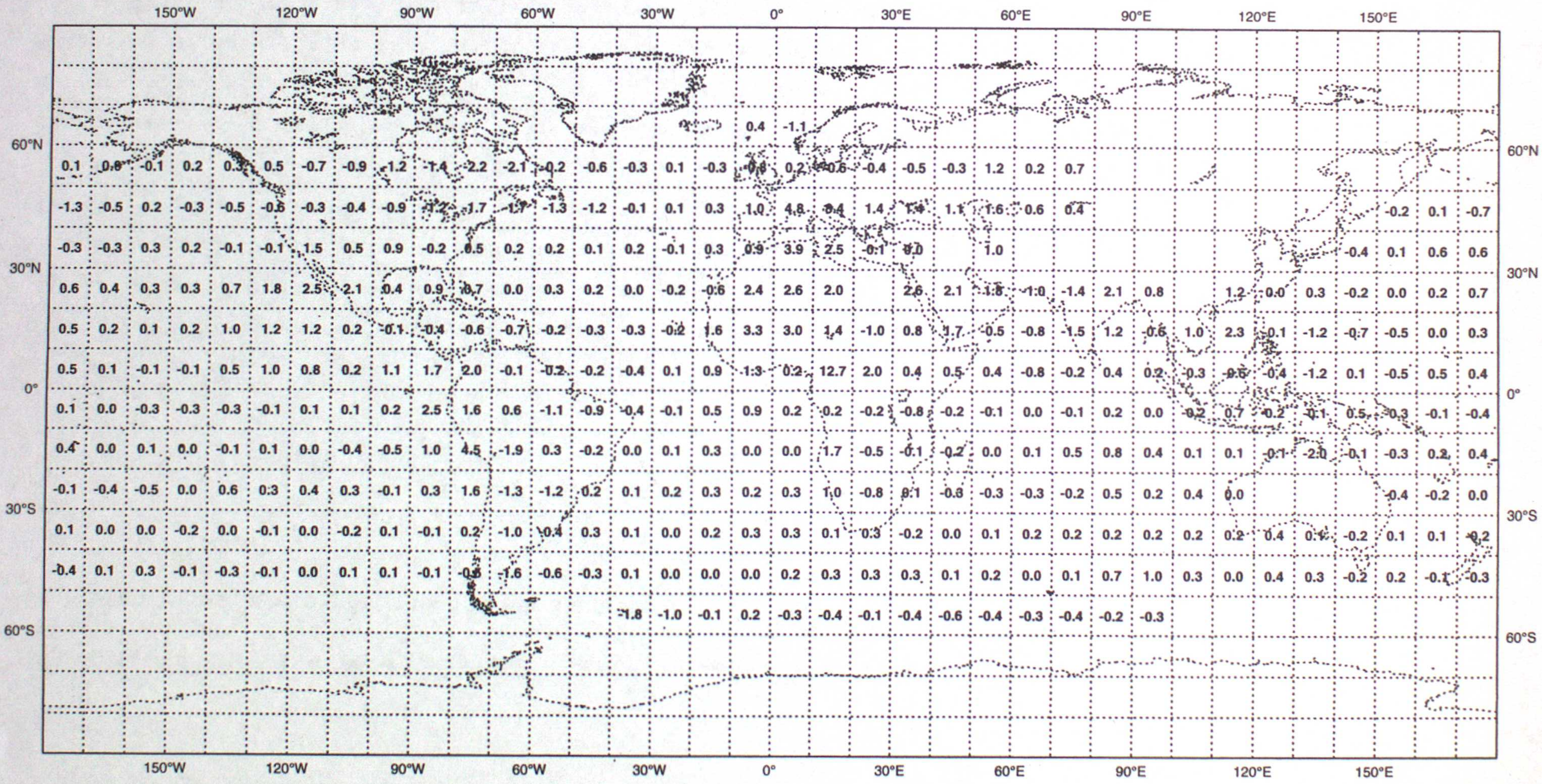
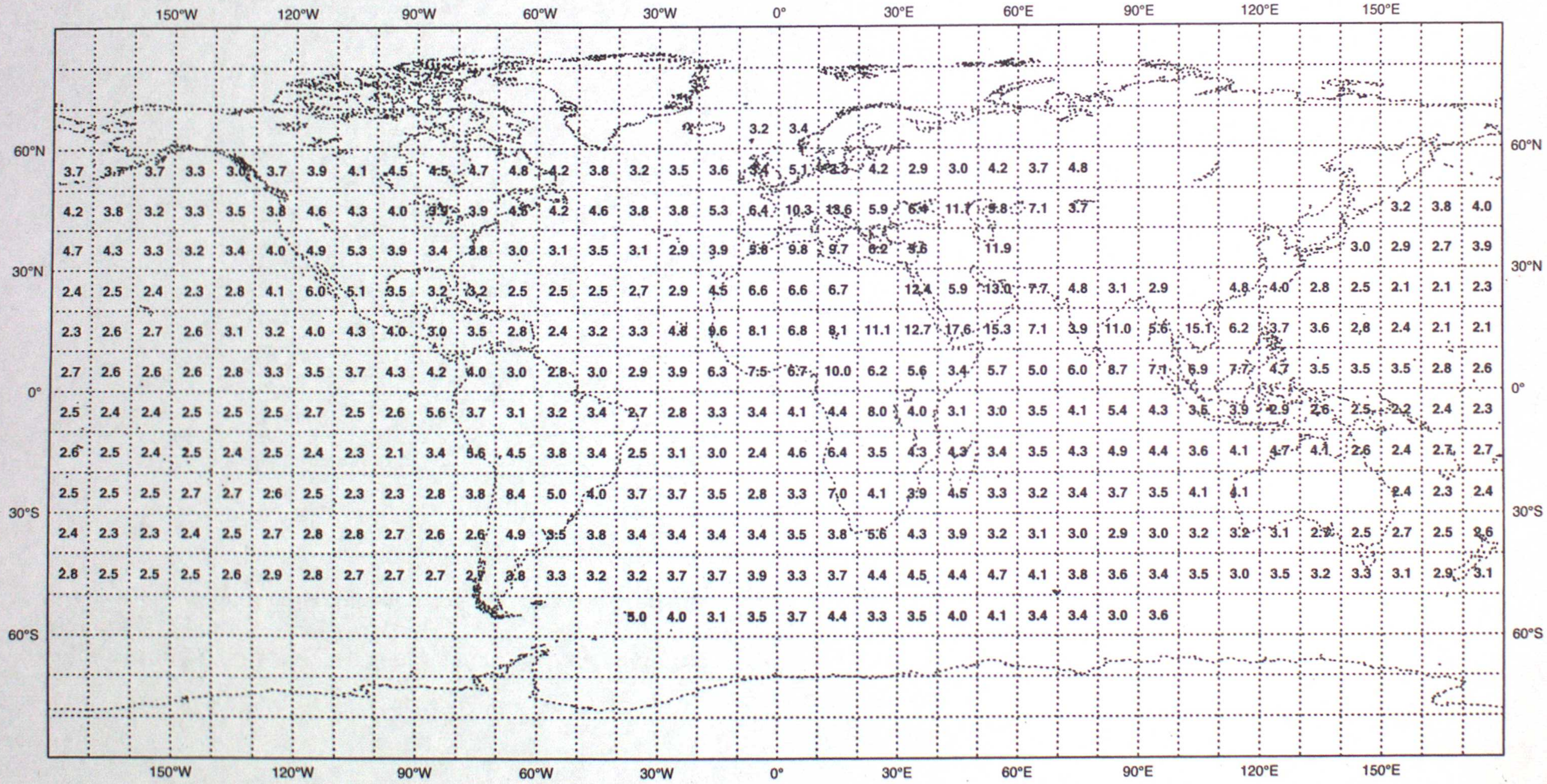

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.4 -1.1
0.1 0.8 -0.1 0.2 0.3 0.5 -0.7 -0.9 -1.2 -1.4 -2.2 -2.1 -0.2 -0.6 -0.3 0.1 -0.3 -0.8 0.2 -0.6 -0.4 -0.5 -0.3 1.2 0.2 0.7
-1.3 -0.5 0.2 -0.3 -0.5 -0.6 -0.3 -0.4 -0.9 -1.2 -1.7 -1.7 -1.3 -1.2 -0.1 0.1 0.3 1.0 4.8 -0.4 1.4 1.4 1.1 1.6 0.6 0.4 -0.2 0.1 -0.7
-0.3 -0.3 0.3 0.2 -0.1 -0.1 1.5 0.5 0.9 -0.2 0.5 0.2 0.2 0.1 0.2 -0.1 0.3 0.9 3.9 2.5 -0.1 0.0 1.0 -0.4 0.1 0.6 0.6
0.6 0.4 0.3 0.3 0.7 1.8 2.5 2.1 0.4 0.9 0.7 0.0 0.3 0.2 0.0 -0.2 -0.6 2.4 2.6 2.0 2.6 2.1 1.8 -1.0 -1.4 2.1 0.8 1.2 0.0 0.3 -0.2 0.0 0.2 0.7
0.5 0.2 0.1 0.2 1.0 1.2 1.2 0.2 -0.1 -0.4 -0.6 -0.7 -0.2 -0.3 -0.3 -0.2 1.6 3.3 3.0 1.4 -1.0 0.8 1.7 -0.5 -0.8 -1.5 1.2 -0.6 1.0 2.3 -0.1 -1.2 -0.7 -0.5 0.0 0.3
0.5 0.1 -0.1 -0.1 0.5 1.0 0.8 0.2 1.1 1.7 2.0 -0.1 -0.2 -0.2 -0.4 0.1 0.9 -1.3 0.2 12.7 2.0 0.4 0.5 0.4 -0.8 -0.2 0.4 0.2 -0.3 -0.6 -0.4 -1.2 0.1 -0.5 0.5 0.4
0.1 0.0 -0.3 -0.3 -0.3 -0.1 0.1 0.1 0.2 2.5 1.6 0.6 -1.1 -0.9 -0.4 -0.1 0.5 0.9 0.2 -0.2 -0.2 -0.8 -0.2 -0.1 0.0 -0.1 0.2 0.0 -0.2 0.7 -0.2 -0.1 0.5 -0.3 -0.1 -0.4
0.4 0.0 0.1 0.0 -0.1 0.1 0.0 -0.4 -0.5 1.0 4.5 -1.9 0.3 -0.2 0.0 0.1 0.3 0.0 0.0 1.7 -0.5 -0.1 -0.2 0.0 0.1 0.5 0.8 0.4 0.1 0.1 -0.1 -2.0 -0.1 -0.3 0.2 0.4
-0.1 -0.4 -0.5 0.0 0.6 0.3 0.4 0.3 -0.1 0.3 1.6 -1.3 -1.2 0.2 0.1 0.2 0.3 0.2 0.3 1.0 -0.8 0.1 -0.6 -0.3 -0.3 -0.2 0.5 0.2 0.4 0.0 -0.4 -0.2 0.0
0.1 0.0 0.0 -0.2 0.0 -0.1 0.0 -0.2 0.1 -0.1 0.2 -1.0 -0.4 0.3 0.1 0.0 0.2 0.3 0.3 0.1 0.3 -0.2 0.0 0.1 0.2 0.2 0.2 0.2 0.2 0.2 0.4 0.1 -0.2 0.1 0.1 -0.2
-0.4 0.1 0.3 -0.1 -0.3 -0.1 0.0 0.1 0.1 -0.1 -0.6 -1.6 -0.6 -0.3 0.1 0.0 0.0 0.0 0.2 0.3 0.3 0.3 0.1 0.2 0.0 0.1 0.7 1.0 0.3 0.0 0.4 0.3 -0.2 0.2 -0.1 -0.3
-1.8 -1.0 -0.1 0.2 -0.3 -0.4 -0.1 -0.4 -0.6 -0.4 -0.3 -0.4 -0.2 -0.3

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). JUNE 2004
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
3.2 3.4
3.7 3.7 3.7 3.3 3.0 3.7 3.9 4.1 4.5 4.5 4.7 4.8 4.2 3.8 3.2 3.5 3.6 3.4 5.1 2.3 4.2 2.9 3.0 4.2 3.7 4.8
4.2 3.8 3.2 3.3 3.5 3.8 4.6 4.3 4.0 3.9 3.9 4.8 4.2 4.6 3.8 3.8 5.3 6.4 10.3 13.6 5.9 6.4 11.1 9.8 7.1 3.7 3.2 3.8 4.0
4.7 4.3 3.3 3.2 3.4 4.0 4.9 5.3 3.9 3.4 3.8 3.0 3.1 3.5 3.1 2.9 3.9 5.8 9.8 9.7 6.2 5.6 11.9 3.0 2.9 2.7 3.9
2.4 2.5 2.4 2.3 2.8 4.1 6.0 5.1 3.5 3.2 3.2 2.5 2.5 2.5 2.7 2.9 4.5 6.6 6.6 6.7 12.4 5.9 13.0 7.7 4.8 3.1 2.9 4.8 4.0 2.8 2.5 2.1 2.1 2.3
2.3 2.6 2.7 2.6 3.1 3.2 4.0 4.3 4.0 3.0 3.5 2.8 2.4 3.2 3.3 4.8 9.6 8.1 6.8 8.1 11.1 12.7 17.6 15.3 7.1 3.9 11.0 5.6 15.1 6.2 3.7 3.6 2.8 2.4 2.1 2.1
2.7 2.6 2.6 2.6 2.8 3.3 3.5 3.7 4.3 4.2 4.0 3.0 2.8 3.0 2.9 3.9 6.3 7.5 6.7 10.0 6.2 5.6 3.4 5.7 5.0 6.0 8.7 7.1 6.9 7.7 4.7 3.5 3.5 3.5 2.8 2.6
2.5 2.4 2.4 2.5 2.5 2.5 2.7 2.5 2.6 5.6 3.7 3.1 3.2 3.4 2.7 2.8 3.3 3.4 4.1 4.4 8.0 4.0 3.1 3.0 3.5 4.1 5.4 4.3 3.5 3.9 2.9 2.6 2.5 2.2 2.4 2.3
2.6 2.5 2.4 2.5 2.4 2.5 2.4 2.3 2.1 3.4 5.6 4.5 3.8 3.4 2.5 3.1 3.0 2.4 4.6 6.4 3.5 4.3 4.3 3.4 3.5 4.3 4.9 4.4 3.6 4.1 4.7 4.1 2.6 2.4 2.7 2.7
2.5 2.5 2.5 2.7 2.7 2.6 2.5 2.3 2.3 2.8 3.8 8.4 5.0 4.0 3.7 3.7 3.5 2.8 3.3 7.0 4.1 3.9 4.5 3.3 3.2 3.4 3.7 3.5 4.1 4.1 2.4 2.3 2.4
2.4 2.3 2.3 2.4 2.5 2.7 2.8 2.8 2.7 2.6 2.6 4.9 3.5 3.8 3.4 3.4 3.4 3.4 3.5 3.8 5.6 4.3 3.9 3.2 3.1 3.0 2.9 3.0 3.2 3.2 3.1 2.9 2.5 2.7 2.5 2.6
2.8 2.5 2.5 2.5 2.6 2.9 2.8 2.7 2.7 2.7 2.7 3.8 3.3 3.2 3.2 3.7 3.7 3.9 3.3 3.7 4.4 4.5 4.4 4.7 4.1 3.8 3.6 3.4 3.5 3.0 3.5 3.2 3.3 3.1 2.9 3.1
5.0 4.0 3.1 3.5 3.7 4.4 3.3 3.5 4.0 4.1 3.4 3.4 3.0 3.6

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: June 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. JUNE 2004
Global average number of observations in 24 hours = 92838

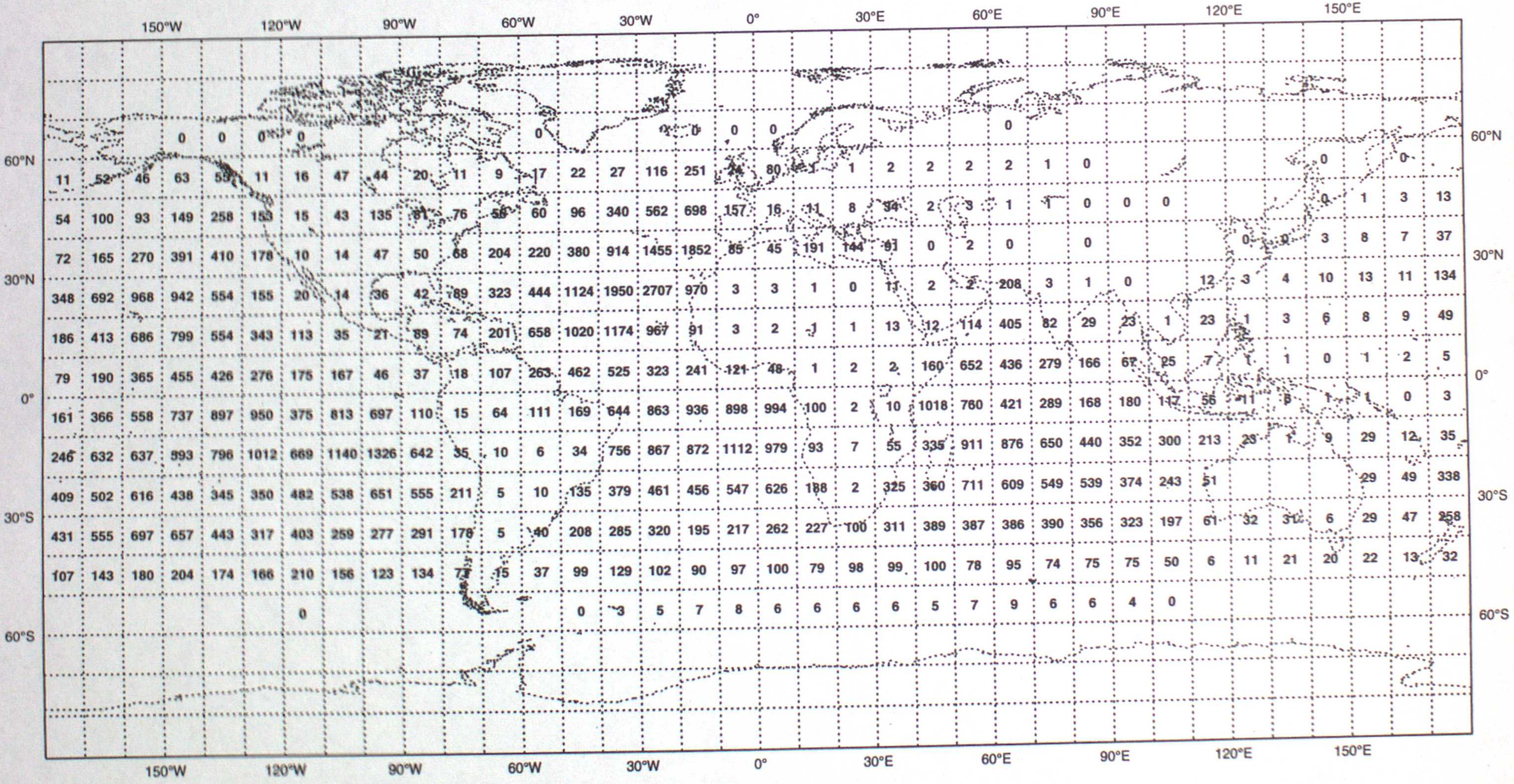

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0 0 0 0
11 52 46 63 55 11 16 47 44 20 11 9 17 22 27 116 251 24 80 1 2 2 2 2 1 0
54 100 93 149 258 153 15 43 135 81 76 58 60 96 340 562 698 157 16 11 8 34 2 3 1 1 0 0 0 0 1 3 13
72 165 270 391 410 178 10 14 47 50 68 204 220 380 914 1455 1852 85 45 191 144 91 0 2 0 0 0 0 3 8 7 37
348 692 968 942 554 155 20 14 36 42 89 323 444 1124 1950 2707 970 3 3 1 0 11 2 2 208 3 1 0 12 3 4 10 13 11 134
186 413 686 799 554 343 113 35 21 89 74 201 658 1020 1174 967 91 3 2 1 1 13 12 114 405 82 29 23 1 23 1 3 6 8 9 49
79 190 365 455 426 276 175 167 46 37 18 107 263 462 525 323 241 121 48 1 2 2 160 652 436 279 166 67 25 7 1 1 0 1 2 5
161 366 558 737 897 950 375 813 697 110 15 64 111 169 644 863 936 898 994 100 2 10 1018 760 421 289 168 180 117 56 11 8 1 1 0 3
246 632 637 593 796 1012 669 1140 1326 642 35 10 6 34 756 867 872 1112 979 93 7 55 335 911 876 650 440 352 300 213 23 1 9 29 12 35
409 502 616 438 345 350 482 538 651 555 211 5 10 135 379 461 456 547 626 188 2 325 360 711 609 549 539 374 243 51 29 49 338
431 555 697 657 443 317 403 259 277 291 178 5 40 208 285 320 195 217 262 227 100 311 389 387 386 390 356 323 197 61 32 31 6 29 47 258
107 143 180 204 174 166 210 156 123 134 72 15 37 99 129 102 90 97 100 79 98 99 100 78 95 74 75 75 50 6 11 21 20 22 13 32
0 0 3 5 7 8 6 6 6 6 5 7 9 6 6 4 0

Figure 15. SATOB 401 - 700 hPa mean daily count. JUNE 2004
Global average number of observations in 24 hours = 18150

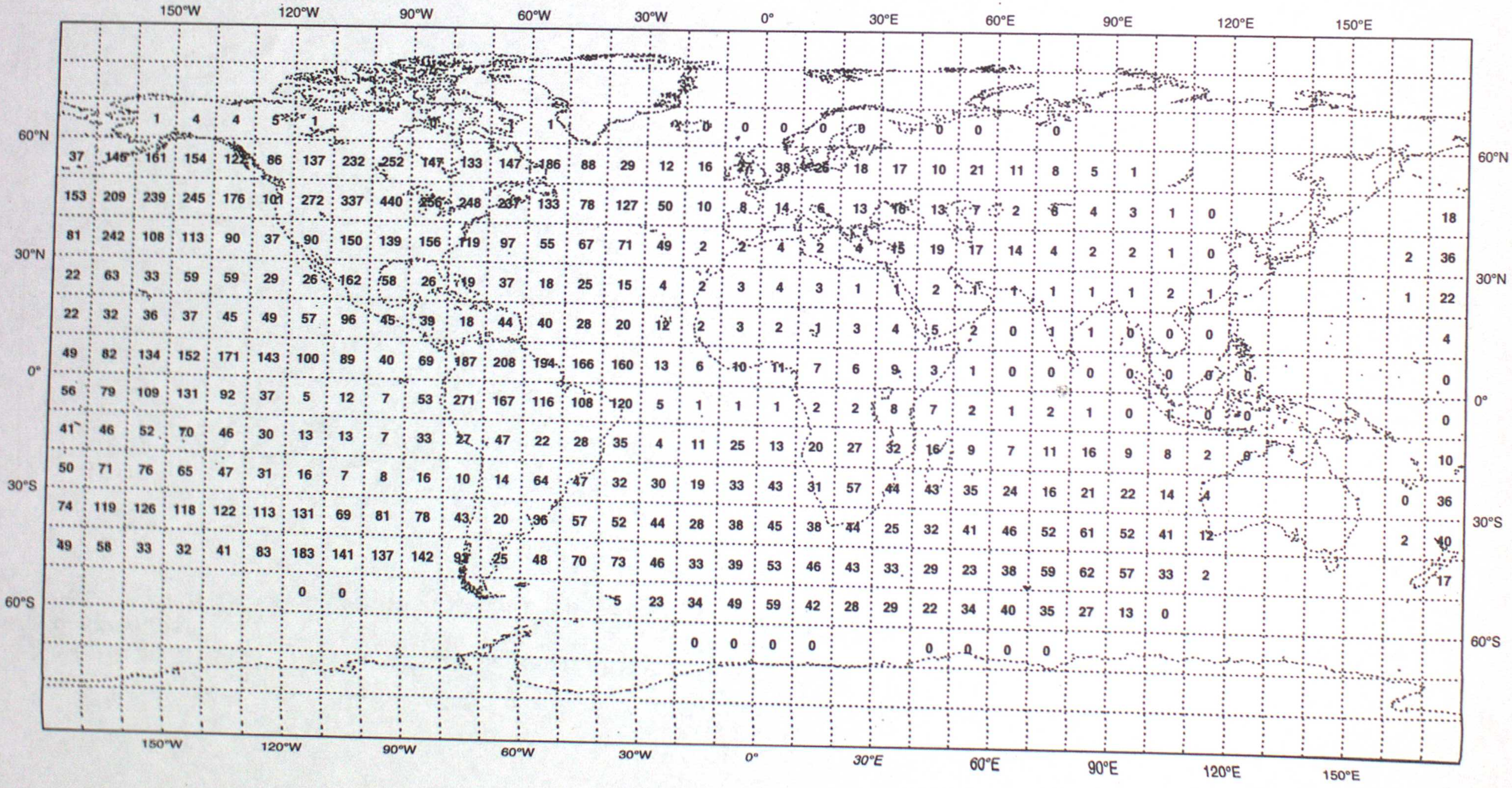

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 4 4 5 1 0 1 1 0 0 0 0 0 0 0 0
37 145 161 154 122 86 137 232 252 147 133 147 186 88 29 12 16 27 38 26 18 17 10 21 11 8 5 1
153 209 239 245 176 101 272 337 440 256 248 237 133 78 127 50 10 8 14 6 13 16 13 7 2 6 4 3 1 0 18
81 242 108 113 90 37 90 150 139 156 119 97 55 67 71 49 2 2 4 2 4 15 19 17 14 4 2 2 1 0 2 36
22 63 33 59 59 29 26 162 58 26 19 37 18 25 15 4 2 3 4 3 1 1 2 1 1 1 1 1 2 1 1 22
22 32 36 37 45 49 57 96 45 39 18 44 40 28 20 12 2 3 2 1 3 4 5 2 0 1 1 0 0 0 4
49 82 134 152 171 143 100 89 40 69 187 208 194 166 160 13 6 10 11 7 6 9 3 1 0 0 0 0 0 0 0 0
56 79 109 131 92 37 5 12 7 53 271 167 116 108 120 5 1 1 1 2 2 8 7 2 1 2 1 0 1 0 0 0
41 46 52 70 46 30 13 13 7 33 27 47 22 28 35 4 11 25 13 20 27 32 16 9 7 11 16 9 8 2 0 10
50 71 76 65 47 31 16 7 8 16 10 14 64 47 32 30 19 33 43 31 57 44 43 35 24 16 21 22 14 4 0 36
74 119 126 118 122 113 131 69 81 78 43 20 36 57 52 44 28 38 45 38 44 25 32 41 46 52 61 52 41 12 2 40
49 58 33 32 41 83 183 141 137 142 92 25 48 70 73 46 33 39 53 46 43 33 29 23 38 59 62 57 33 2 17
0 0 5 23 34 49 59 42 28 29 22 34 40 35 27 13 0
0 0 0 0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. JUNE 2004
All observations
Arrows are plotted where greater than 10 obs are present

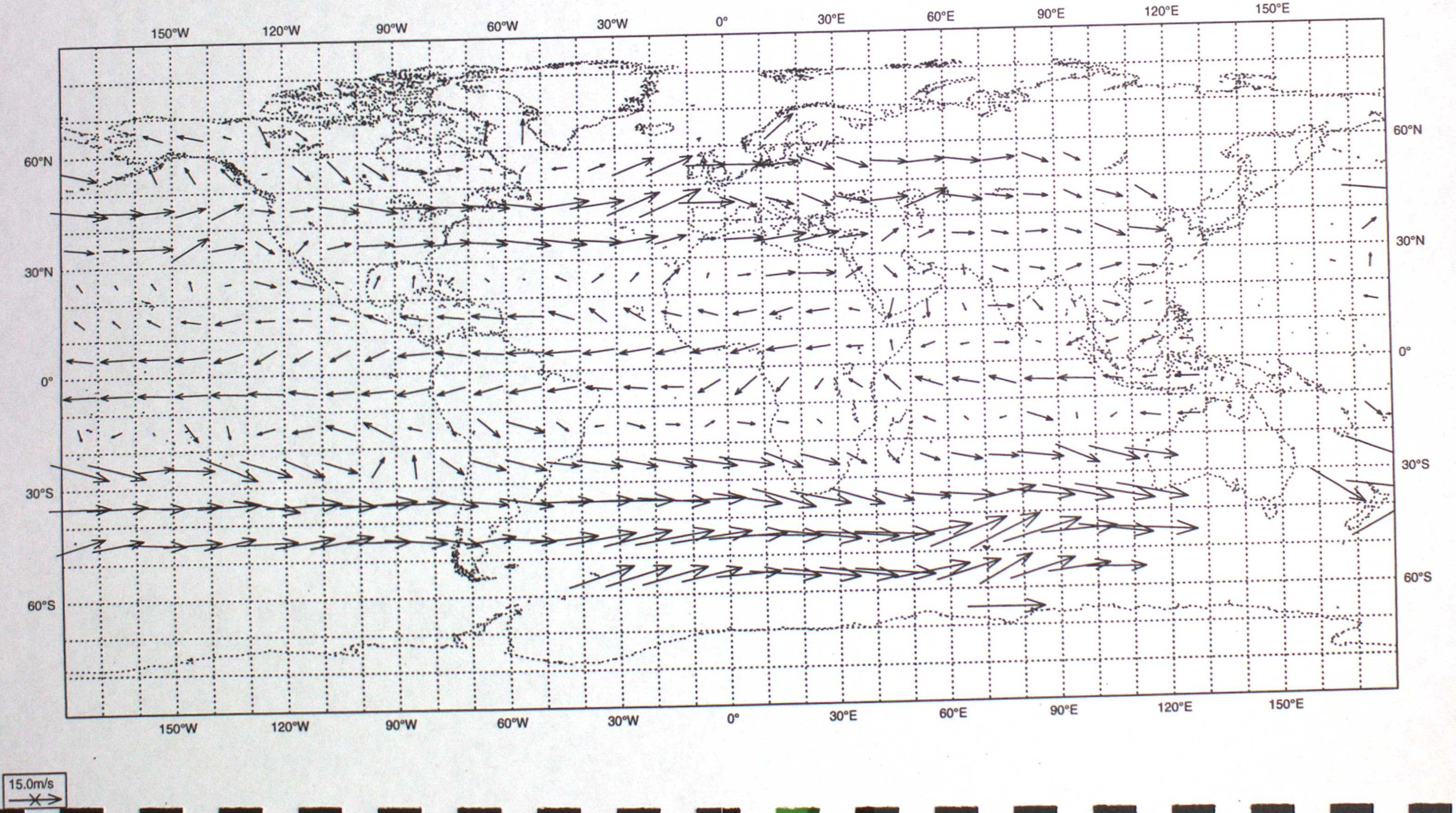

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. JUNE 2004
All observations
Arrows are plotted where greater than 10 obs are present

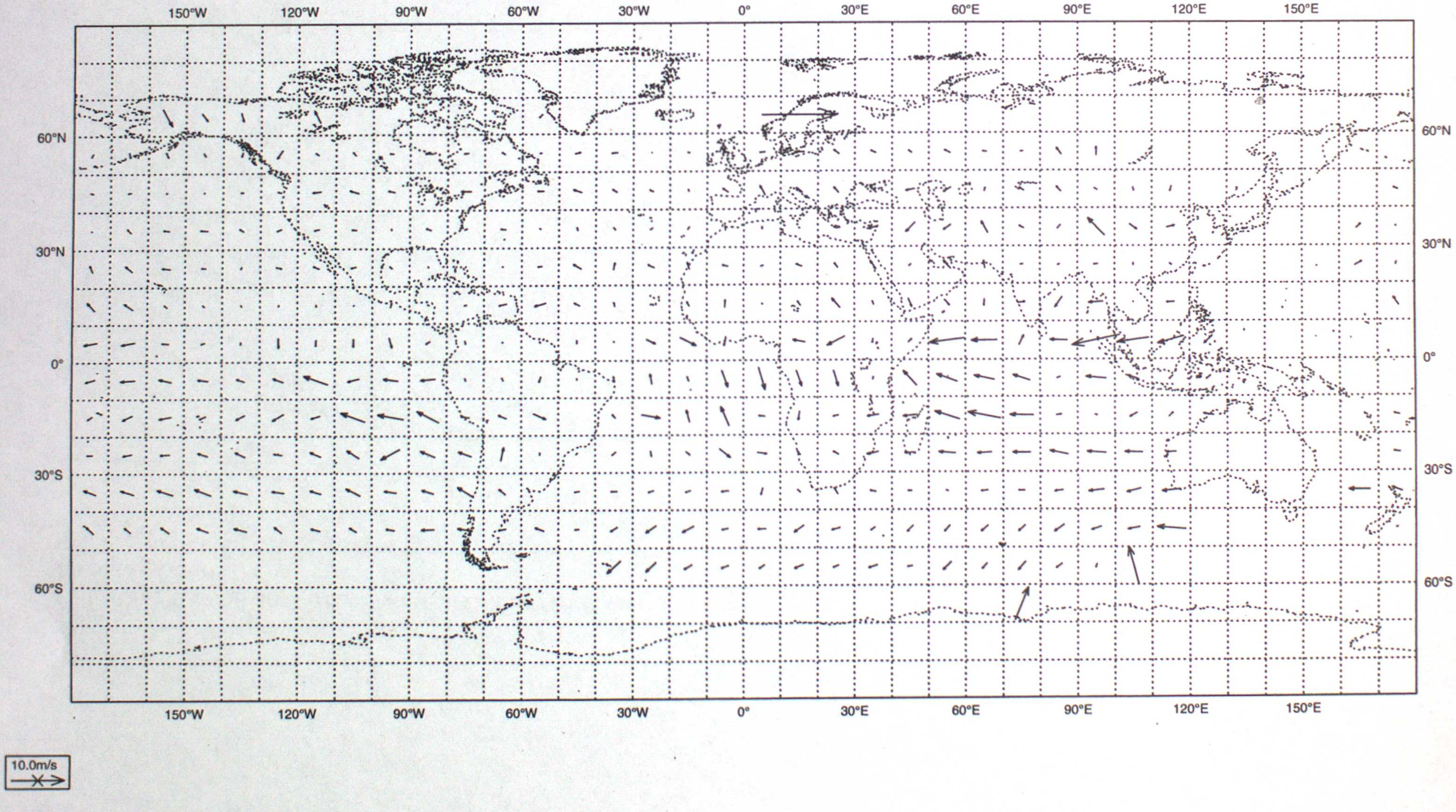

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). JUNE 2004
All observations
Values are plotted where greater than 10 obs are present

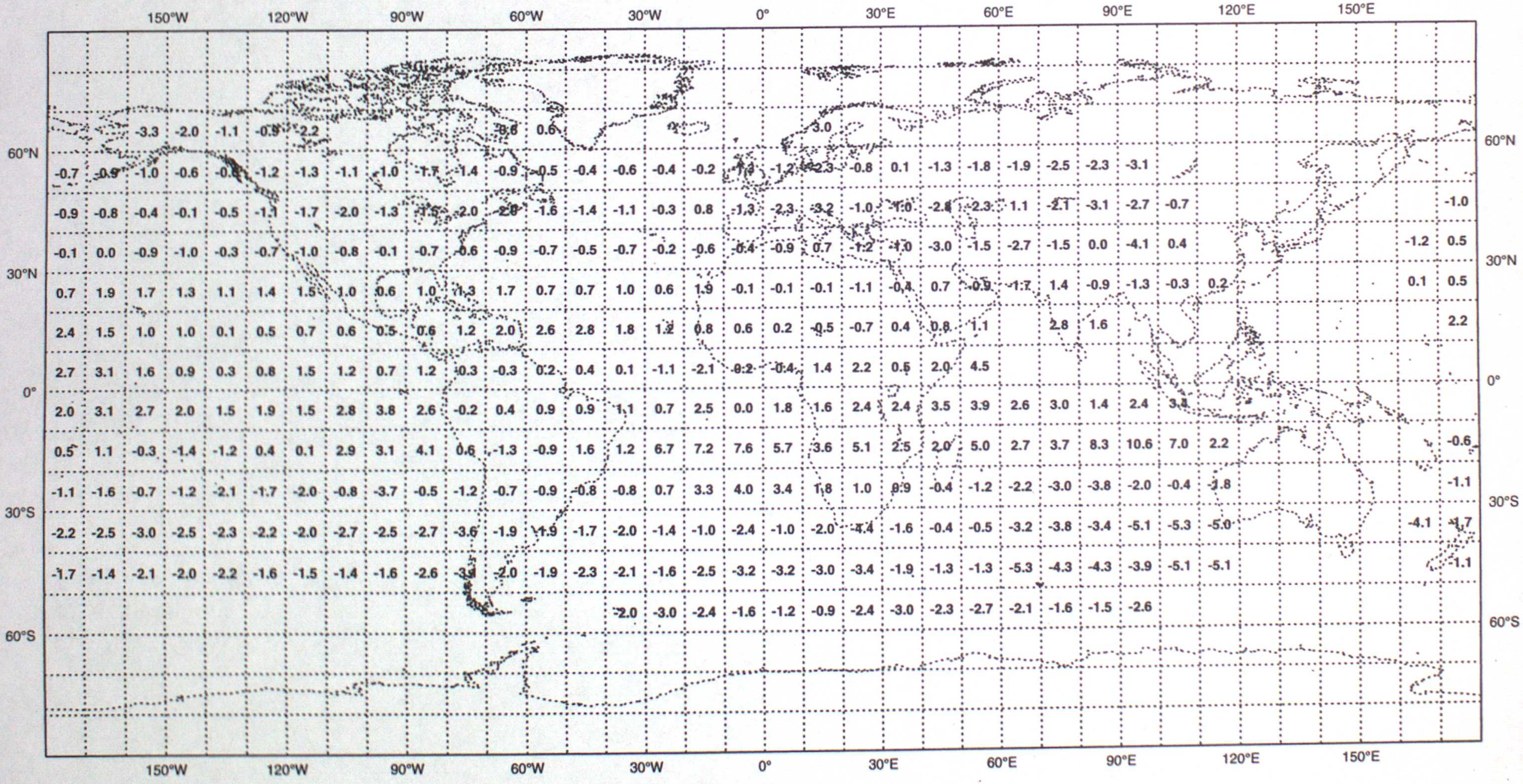

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-3.3 -2.0 -1.1 -0.9 -2.2 -3.6 0.6 3.0
-0.7 -0.9 -1.0 -0.6 -0.8 -1.2 -1.3 -1.1 -1.0 -1.7 -1.4 -0.9 -0.5 -0.4 -0.6 -0.4 -0.2 -1.3 -1.2 -2.3 -0.8 0.1 -1.3 -1.8 -1.9 -2.5 -2.3 -3.1
-0.9 -0.8 -0.4 -0.1 -0.5 -1.1 -1.7 -2.0 -1.3 -1.5 -2.0 -2.8 -1.6 -1.4 -1.1 -0.3 0.8 -1.3 -2.3 -3.2 -1.0 -1.0 -2.8 -2.3 1.1 -2.1 -3.1 -2.7 -0.7 -1.0
-0.1 0.0 -0.9 -1.0 -0.3 -0.7 -1.0 -0.8 -0.1 -0.7 -0.6 -0.9 -0.7 -0.5 -0.7 -0.2 -0.6 -0.4 -0.9 0.7 -1.2 -1.0 -3.0 -1.5 -2.7 -1.5 0.0 -4.1 0.4 -1.2 0.5
0.7 1.9 1.7 1.3 1.1 1.4 1.5 1.0 0.6 1.0 1.3 1.7 0.7 0.7 1.0 0.6 1.9 -0.1 -0.1 -0.1 -1.1 -0.4 0.7 -0.9 -1.7 1.4 -0.9 -1.3 -0.3 0.2 0.1 0.5
2.4 1.5 1.0 1.0 0.1 0.5 0.7 0.6 0.5 0.6 1.2 2.0 2.6 2.8 1.8 1.2 0.8 0.6 0.2 -0.5 -0.7 0.4 0.8 1.1 2.8 1.6 2.2
2.7 3.1 1.6 0.9 0.3 0.8 1.5 1.2 0.7 1.2 0.3 -0.3 0.2 0.4 0.1 -1.1 -2.1 0.2 -0.4 1.4 2.2 0.5 2.0 4.5
2.0 3.1 2.7 2.0 1.5 1.9 1.5 2.8 3.8 2.6 -0.2 0.4 0.9 0.9 1.1 0.7 2.5 0.0 1.8 1.6 2.4 2.4 3.5 3.9 2.6 3.0 1.4 2.4 3.4
0.5 1.1 -0.3 -1.4 -1.2 0.4 0.1 2.9 3.1 4.1 0.6 -1.3 -0.9 1.6 1.2 6.7 7.2 7.6 5.7 3.6 5.1 2.5 2.0 5.0 2.7 3.7 8.3 10.6 7.0 2.2 -0.6
-1.1 -1.6 -0.7 -1.2 -2.1 -1.7 -2.0 -0.8 -3.7 -0.5 -1.2 -0.7 -0.9 -0.8 -0.8 0.7 3.3 4.0 3.4 1.8 1.0 0.9 -0.4 -1.2 -2.2 -3.0 -3.8 -2.0 -0.4 -1.8 -1.1
-2.2 -2.5 -3.0 -2.5 -2.3 -2.2 -2.0 -2.7 -2.5 -2.7 -3.6 -1.9 -1.9 -1.7 -2.0 -1.4 -1.0 -2.4 -1.0 -2.0 -4.4 -1.6 -0.4 -0.5 -3.2 -3.8 -3.4 -5.1 -5.3 -5.0 -4.1 -1.7
-1.7 -1.4 -2.1 -2.0 -2.2 -1.6 -1.5 -1.4 -1.6 -2.6 -3.4 -2.0 -1.9 -2.3 -2.1 -1.6 -2.5 -3.2 -3.2 -3.0 -3.4 -1.9 -1.3 -1.3 -5.3 -4.3 -4.3 -3.9 -5.1 -5.1 -1.1
-2.0 -3.0 -2.4 -1.6 -1.2 -0.9 -2.4 -3.0 -2.3 -2.7 -2.1 -1.6 -1.5 -2.6

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). JUNE 2004
All observations
Values are plotted where greater than 10 obs are present

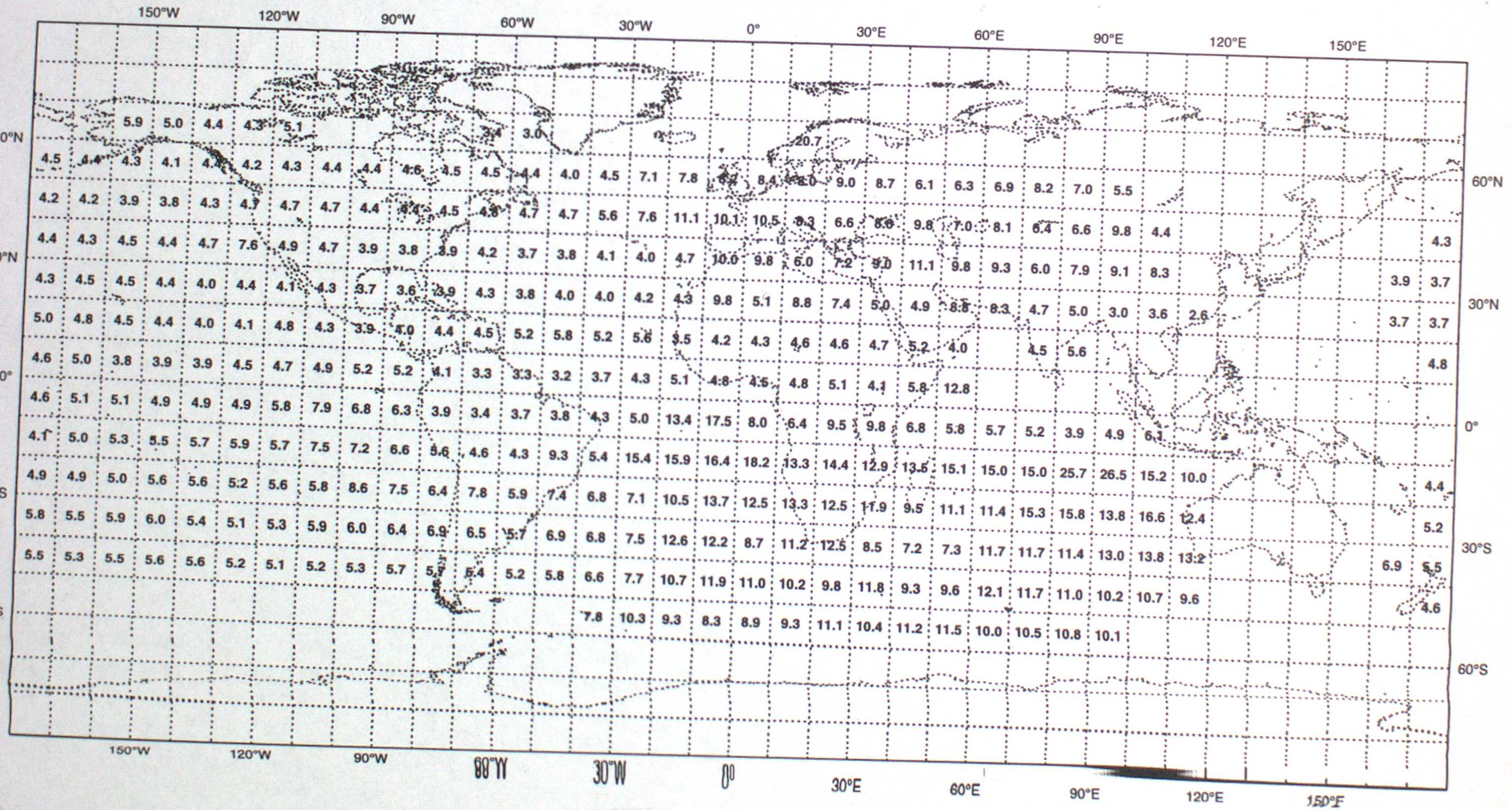
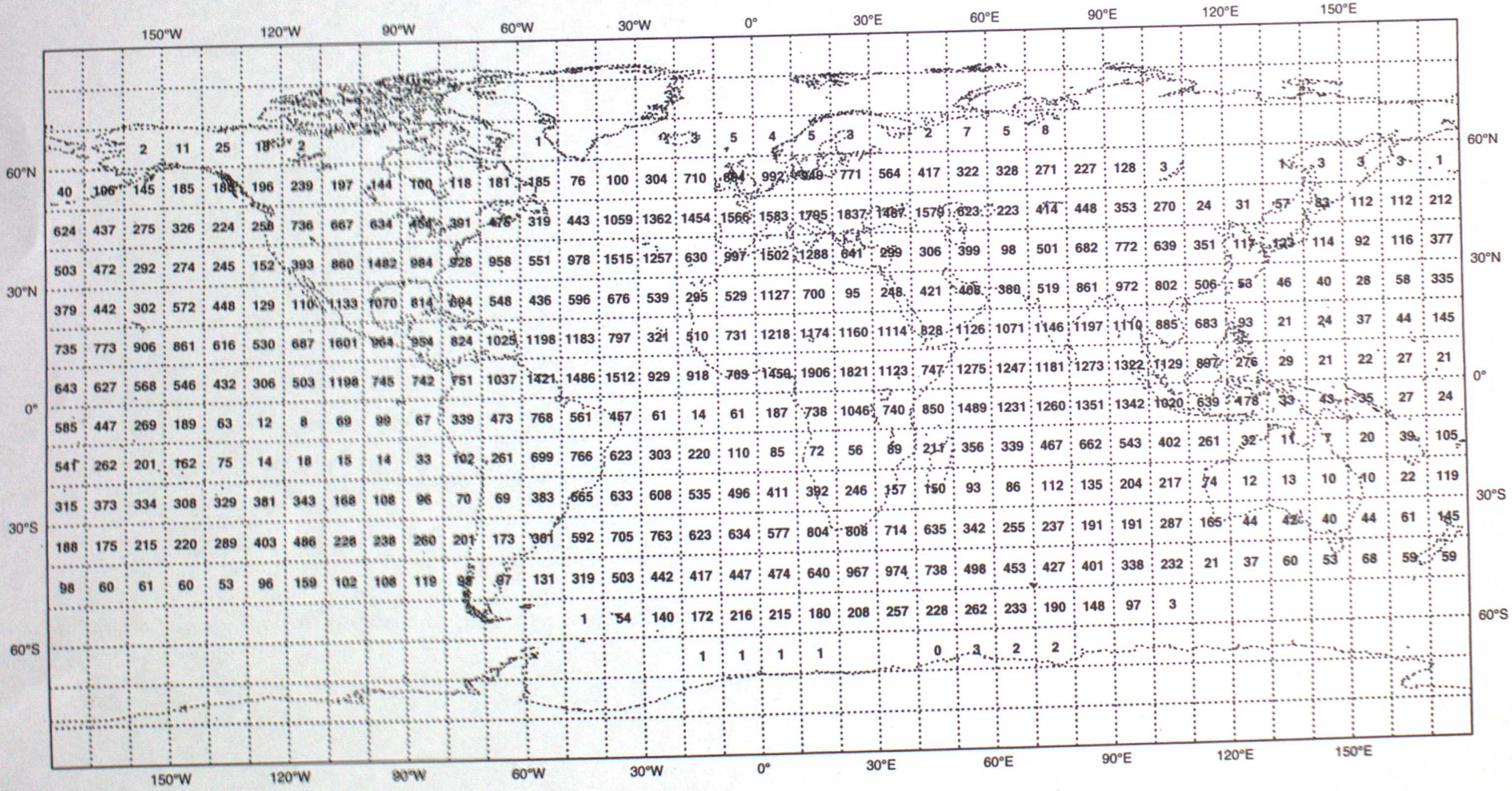

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5.9 5.0 4.4 4.3 5.1 3.4 3.0 20.7
4.5 4.4 4.3 4.1 4.4 4.2 4.3 4.4 4.4 4.6 4.5 4.5 4.4 4.0 4.5 7.1 7.8 6.2 8.4 8.0 9.0 8.7 6.1 6.3 6.9 8.2 7.0 5.5
4.2 4.2 3.9 3.8 4.3 4.7 4.7 4.7 4.4 4.4 4.5 4.8 4.7 4.7 5.6 7.6 11.1 10.1 10.5 9.3 6.6 8.6 9.8 7.0 8.1 6.4 6.6 9.8 4.4 4.3
4.4 4.3 4.5 4.4 4.7 7.6 4.9 4.7 3.9 3.8 3.9 4.2 3.7 3.8 4.1 4.0 4.7 10.0 9.8 6.0 7.2 9.0 11.1 9.8 9.3 6.0 7.9 9.1 8.3 3.9 3.7
4.3 4.5 4.5 4.4 4.0 4.4 4.1 4.3 3.7 3.6 3.9 4.3 3.8 4.0 4.0 4.2 4.3 9.8 5.1 8.8 7.4 5.0 4.9 8.8 8.3 4.7 5.0 3.0 3.6 2.6 3.7 3.7
5.0 4.8 4.5 4.4 4.0 4.1 4.8 4.3 3.9 4.0 4.4 4.5 5.2 5.8 5.2 5.6 3.5 4.2 4.3 4.6 4.6 4.7 5.2 4.0 4.5 5.6 4.8
4.6 5.0 3.8 3.9 3.9 4.5 4.7 4.9 5.2 5.2 4.1 3.3 3.3 3.2 3.7 4.3 5.1 4.8 4.5 4.8 5.1 4.1 5.8 12.8
4.6 5.1 5.1 4.9 4.9 4.9 5.8 7.9 6.8 6.3 3.9 3.4 3.7 3.8 4.3 5.0 13.4 17.5 8.0 6.4 9.5 9.8 6.8 5.8 5.7 5.2 3.9 4.9 6.1
4.1 5.0 5.3 5.5 5.7 5.9 5.7 7.5 7.2 6.6 5.6 4.6 4.3 9.3 5.4 15.4 15.9 16.4 18.2 13.3 14.4 12.9 13.5 15.1 15.0 15.0 25.7 26.5 15.2 10.0 4.4
4.9 4.9 5.0 5.6 5.6 5.2 5.6 5.8 8.6 7.5 6.4 7.8 5.9 7.4 6.8 7.1 10.5 13.7 12.5 13.3 12.5 11.9 9.5 11.1 11.4 15.3 15.8 13.8 16.6 12.4 5.2
5.8 5.5 5.9 6.0 5.4 5.1 5.3 5.9 6.0 6.4 6.9 6.5 5.7 6.9 6.8 7.5 12.6 12.2 8.7 11.2 12.5 8.5 7.2 7.3 11.7 11.7 11.4 13.0 13.8 13.2 6.9 5.5
5.5 5.3 5.5 5.6 5.6 5.2 5.1 5.2 5.3 5.7 5.7 5.4 5.2 5.8 6.6 7.7 10.7 11.9 11.0 10.2 9.8 11.8 9.3 9.6 12.1 11.7 11.0 10.2 10.7 9.6 4.6
7.8 10.3 9.3 8.3 8.9 9.3 11.1 10.4 11.2 11.5 10.0 10.5 10.8 10.1

Figure 20. SATOB 101 - 400 hPa mean daily count. JUNE 2004
Global average number of observations in 24 hours = 188855



		2	11	25	18	2					2	1			2	3	5	4	5	3		2	7	5	8										
40	106	145	185	188	196	239	197	144	100	118	181	185	76	100	304	710	884	992	949	771	564	417	322	328	271	227	128	3			1	3	3	3	1
624	437	275	326	224	258	736	667	634	454	391	476	319	443	1059	1362	1454	1566	1583	1795	1837	1487	1579	623	223	414	448	353	270	24	31	57	83	112	112	212
503	472	292	274	245	152	393	860	1482	984	928	958	551	978	1515	1257	630	997	1502	1288	641	299	306	399	98	501	682	772	639	351	117	123	114	92	116	377
379	442	302	572	448	129	110	1133	1070	814	694	548	436	596	676	539	295	529	1127	700	95	248	421	408	380	519	861	972	802	506	58	46	40	28	58	335
735	773	906	861	616	530	687	1601	964	954	824	1025	1198	1183	797	321	510	731	1218	1174	1160	1114	828	1126	1071	1146	1197	1110	885	683	93	21	24	37	44	145
643	627	568	546	432	306	503	1198	745	742	751	1037	1421	1486	1512	929	918	769	1458	1906	1821	1123	747	1275	1247	1181	1273	1322	1129	897	276	29	21	22	27	21
585	447	269	189	63	12	8	69	99	67	339	473	768	561	457	61	14	61	187	738	1046	740	850	1489	1231	1260	1351	1342	1020	639	478	33	43	35	27	24
541	262	201	162	75	14	18	15	14	33	102	261	699	766	623	303	220	110	85	72	56	89	211	356	339	467	662	543	402	261	32	11	7	20	39	105
315	373	334	308	329	381	343	168	108	96	70	69	383	665	633	608	535	496	411	392	246	157	150	93	86	112	135	204	217	74	12	13	10	10	22	119
188	175	215	220	289	403	486	228	238	260	201	173	361	592	705	763	623	634	577	804	808	714	635	342	255	237	191	191	287	165	44	42	40	44	61	145
98	60	61	60	53	96	159	102	108	119	98	87	131	319	503	442	417	447	474	640	967	974	738	498	453	427	401	338	232	21	37	60	53	68	59	59
													1	54	140	172	216	215	180	208	257	228	262	233	190	148	97	3							
																1	1	1	1			0	3	2	2										

Figure 21. SATOB 101 - 400 hPa vector mean wind. JUNE 2004
All observations
Arrows are plotted where greater than 10 obs are present

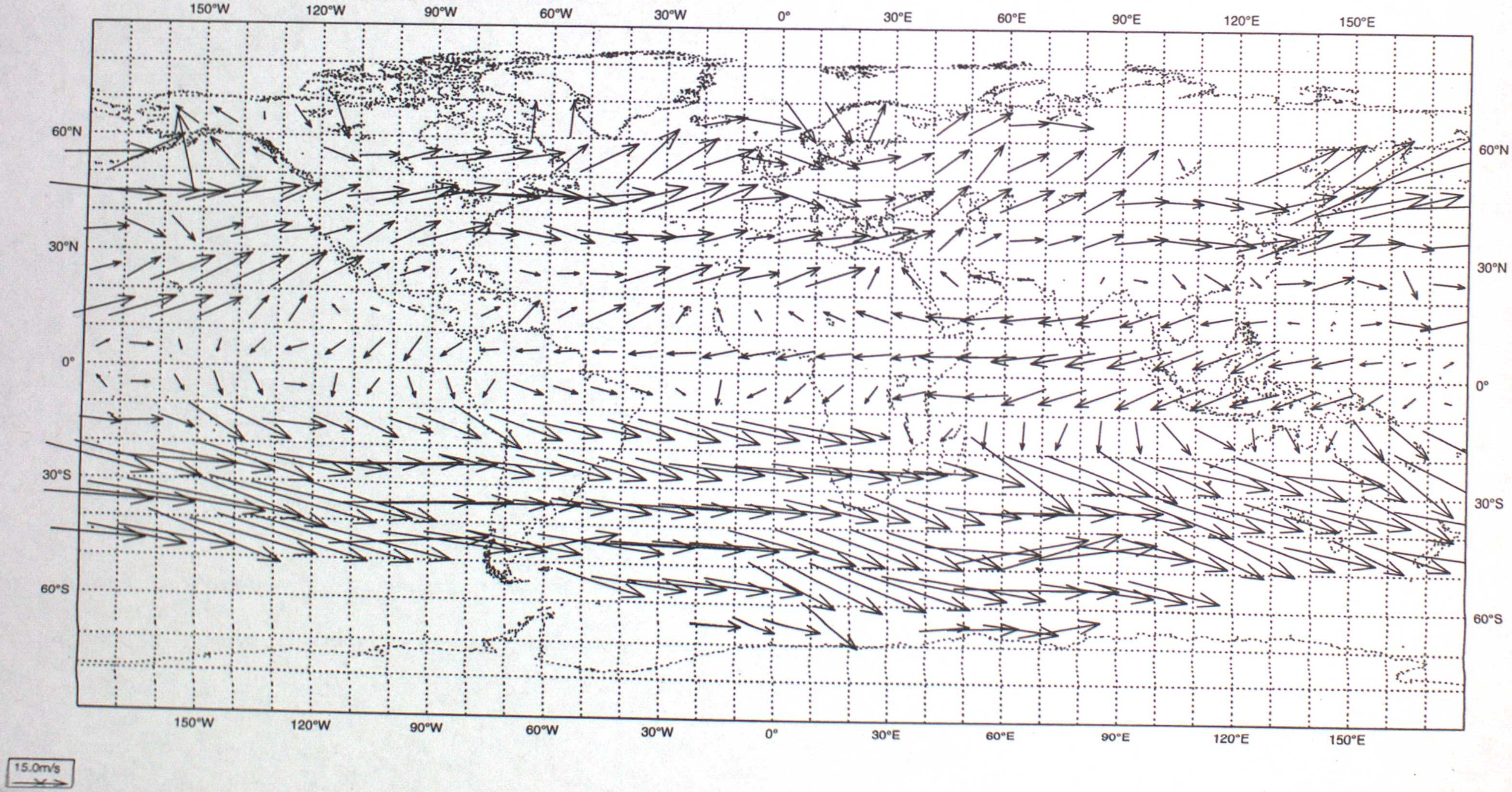

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. JUNE 2004
All observations
Arrows are plotted where greater than 10 obs are present

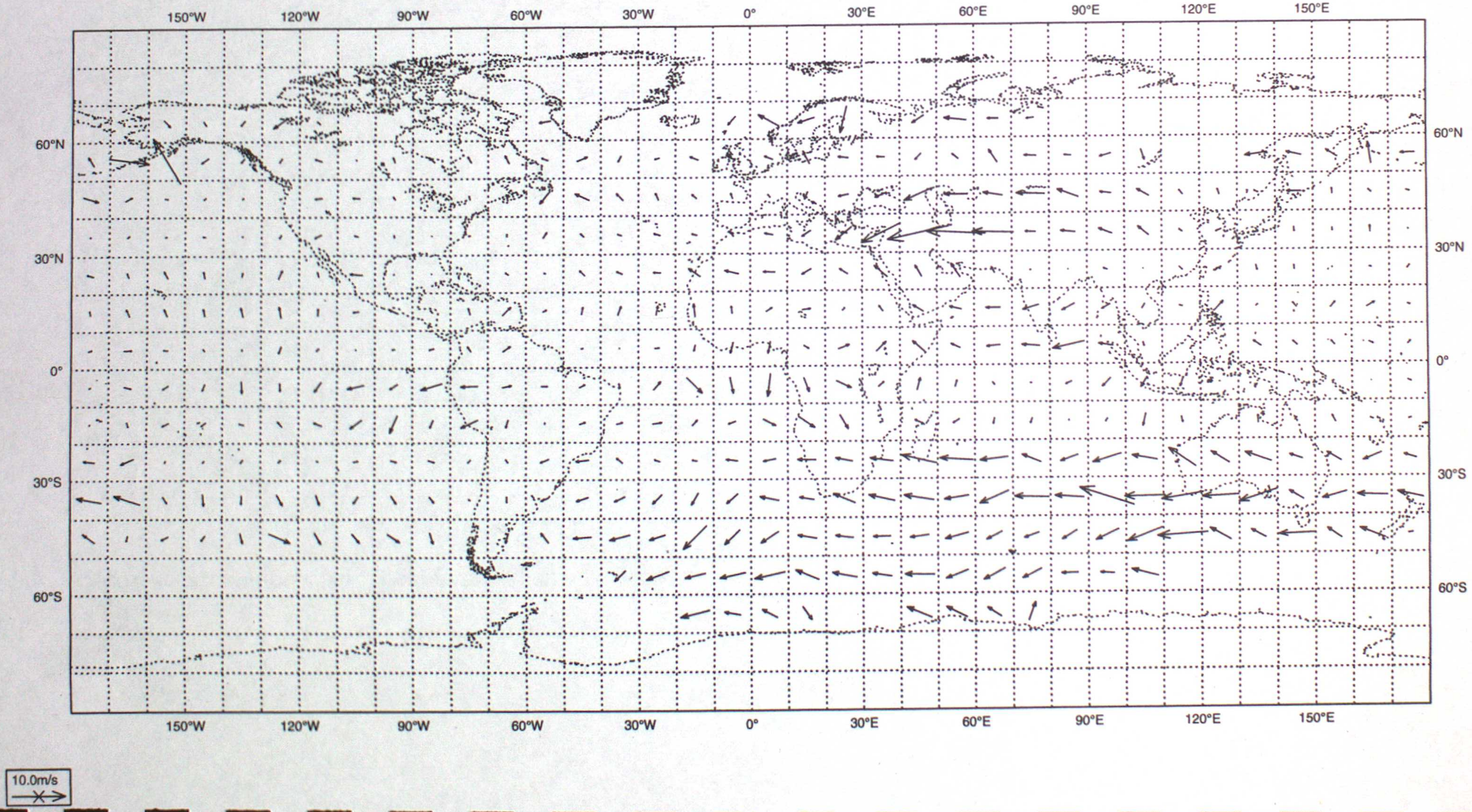

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). JUNE 2004
All observations
Values are plotted where greater than 10 obs are present

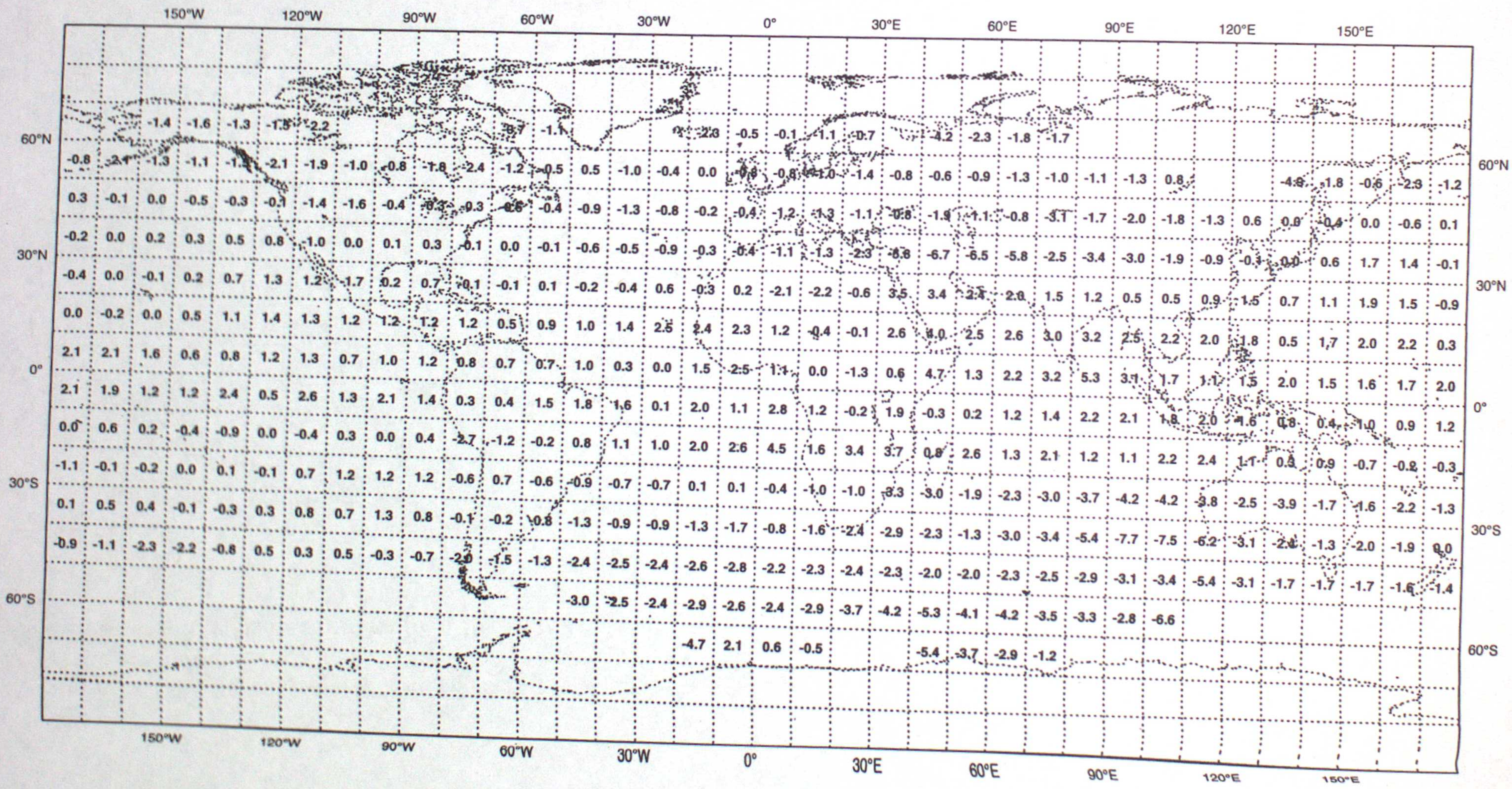
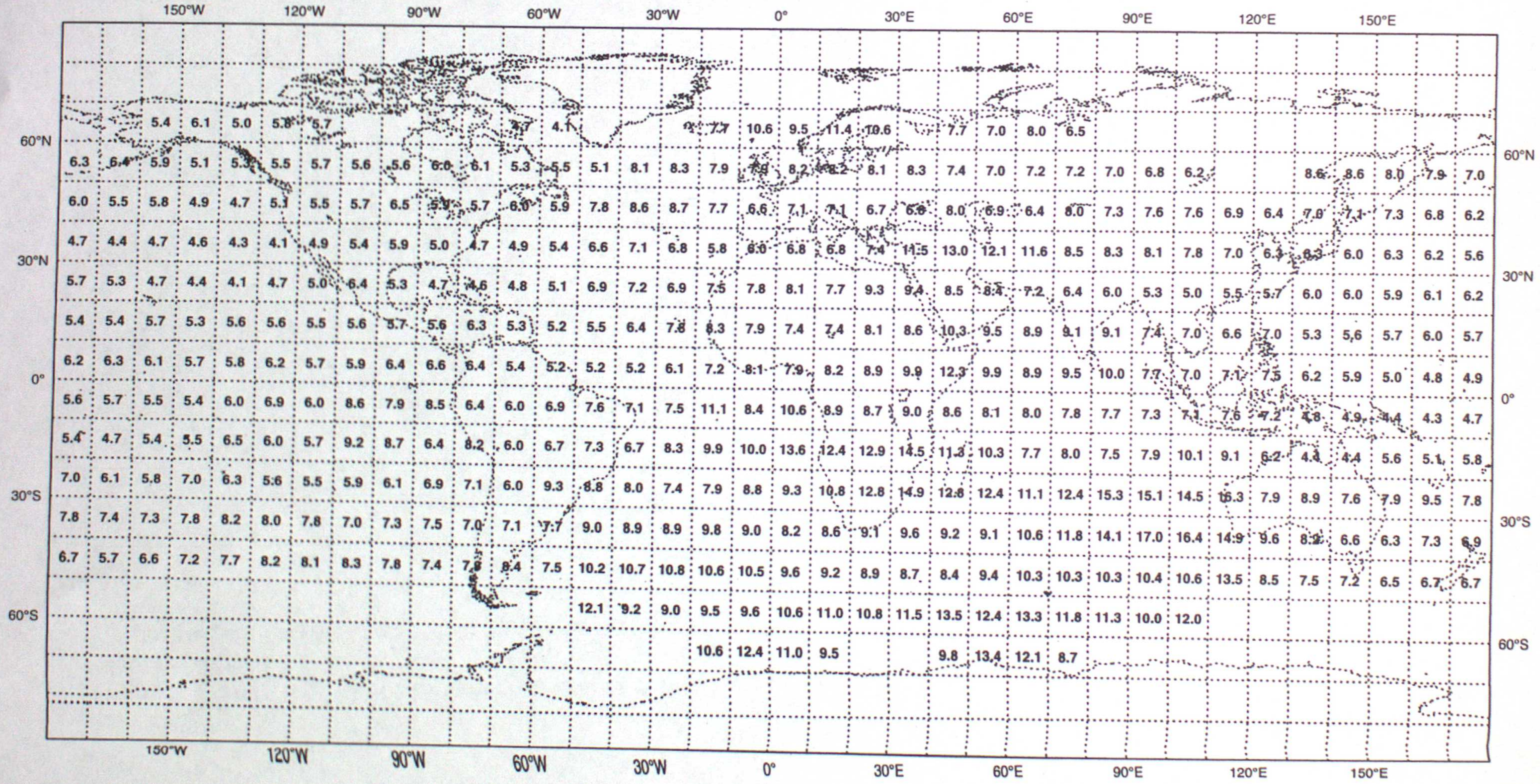

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). JUNE 2004
All observations
Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5.4 6.1 5.0 5.8 5.7 4.7 4.1 7.7 10.6 9.5 11.4 10.6 7.7 7.0 8.0 6.5
6.3 6.4 5.9 5.1 5.3 5.5 5.7 5.6 5.6 6.0 6.1 5.3 5.5 5.1 8.1 8.3 7.9 7.9 8.2 8.2 8.1 8.3 7.4 7.0 7.2 7.2 7.0 6.8 6.2 8.6 8.6 8.0 7.9 7.0
6.0 5.5 5.8 4.9 4.7 5.1 5.5 5.7 6.5 5.9 5.7 6.0 5.9 7.8 8.6 8.7 7.7 6.6 7.1 7.1 6.7 6.8 8.0 6.9 6.4 8.0 7.3 7.6 7.6 6.9 6.4 7.0 7.1 7.3 6.8 6.2
4.7 4.4 4.7 4.6 4.3 4.1 4.9 5.4 5.9 5.0 4.7 4.9 5.4 6.6 7.1 6.8 5.8 6.0 6.8 6.8 7.4 11.5 13.0 12.1 11.6 8.5 8.3 8.1 7.8 7.0 6.3 6.3 6.0 6.3 6.2 5.6
5.7 5.3 4.7 4.4 4.1 4.7 5.0 6.4 5.3 4.7 4.6 4.8 5.1 6.9 7.2 6.9 7.5 7.8 8.1 7.7 9.3 9.4 8.5 8.4 7.2 6.4 6.0 5.3 5.0 5.5 5.7 6.0 6.0 5.9 6.1 6.2
5.4 5.4 5.7 5.3 5.6 5.6 5.5 5.6 5.7 5.6 6.3 5.3 5.2 5.5 6.4 7.8 6.3 7.9 7.4 7.4 8.1 8.6 10.3 9.5 8.9 9.1 9.1 7.4 7.0 6.6 7.0 5.3 5.6 5.7 6.0 5.7
6.2 6.3 6.1 5.7 5.8 6.2 5.7 5.9 6.4 6.6 6.4 5.4 5.2 5.2 5.2 6.1 7.2 8.1 7.9 8.2 8.9 9.9 12.3 9.9 8.9 9.5 10.0 7.7 7.0 7.1 7.5 6.2 5.9 5.0 4.8 4.9
5.6 5.7 5.5 5.4 6.0 6.9 6.0 8.6 7.9 8.5 6.4 6.0 6.9 7.6 7.1 7.5 11.1 8.4 10.6 8.9 8.7 9.0 8.6 8.1 8.0 7.8 7.7 7.3 7.1 7.6 7.2 4.8 4.9 4.4 4.3 4.7
5.4 4.7 5.4 5.5 6.5 6.0 5.7 9.2 8.7 6.4 8.2 6.0 6.7 7.3 6.7 8.3 9.9 10.0 13.6 12.4 12.9 14.5 11.3 10.3 7.7 8.0 7.5 7.9 10.1 9.1 6.2 4.4 4.4 5.6 5.1 5.8
7.0 6.1 5.8 7.0 6.3 5.6 5.5 5.9 6.1 6.9 7.1 6.0 9.3 8.8 8.0 7.4 7.9 8.8 9.3 10.8 12.8 14.9 12.8 12.4 11.1 12.4 15.3 15.1 14.5 16.3 7.9 8.9 7.6 7.9 9.5 7.8
7.8 7.4 7.3 7.8 8.2 8.0 7.8 7.0 7.3 7.5 7.0 7.1 7.7 9.0 8.9 8.9 9.8 9.0 8.2 8.6 9.1 9.6 9.2 9.1 10.6 11.8 14.1 17.0 16.4 14.9 9.6 8.2 6.6 6.3 7.3 6.9
6.7 5.7 6.6 7.2 7.7 8.2 8.1 8.3 7.8 7.4 7.8 8.4 7.5 10.2 10.7 10.8 10.6 10.5 9.6 9.2 8.9 8.7 8.4 9.4 10.3 10.3 10.3 10.4 10.6 13.5 8.5 7.5 7.2 6.5 6.7 6.7
12.1 9.2 9.0 9.5 9.6 10.6 11.0 10.8 11.5 13.5 12.4 13.3 11.8 11.3 10.0 12.0
10.6 12.4 11.0 9.5 9.8 13.4 12.1 8.7

MONITORING OF SATELLITE TEMPERATURES

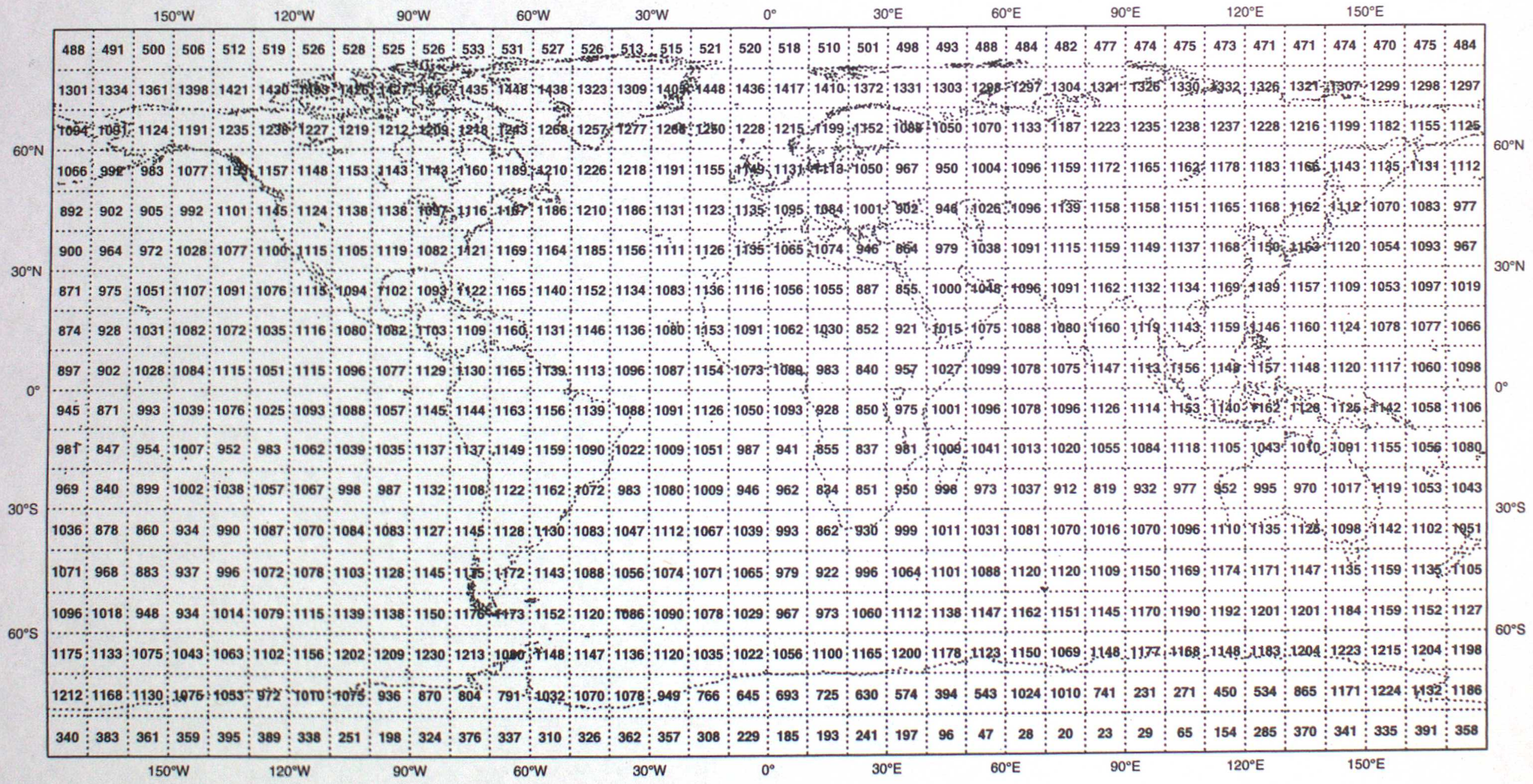
MONITORING CENTRE: EXETER

MONTH: June 2004

Monitoring procedures

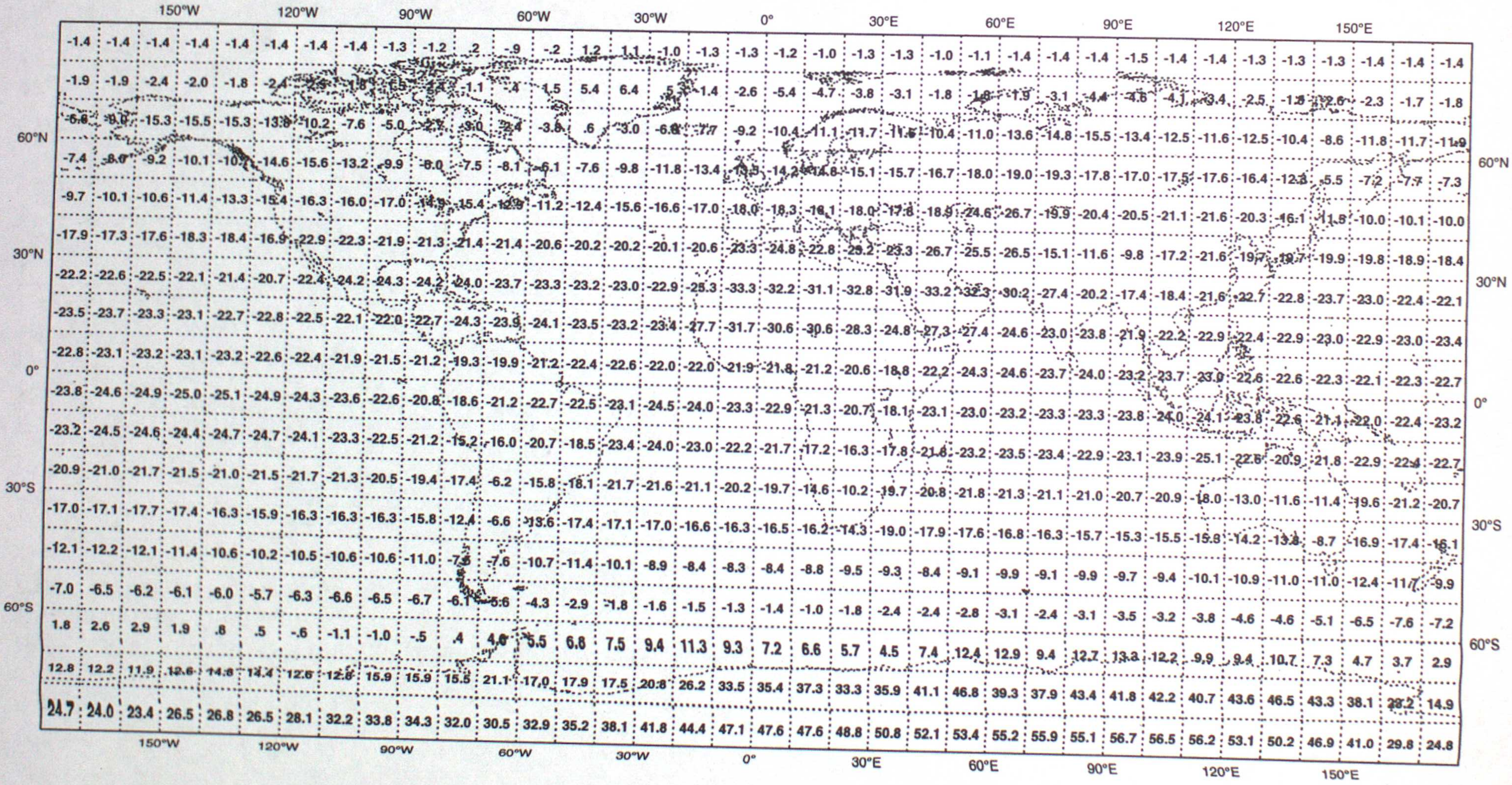
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100) :Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. JUNE 2004
NOAA15, using all observations
Global average number of observations in 24 hours = 655275



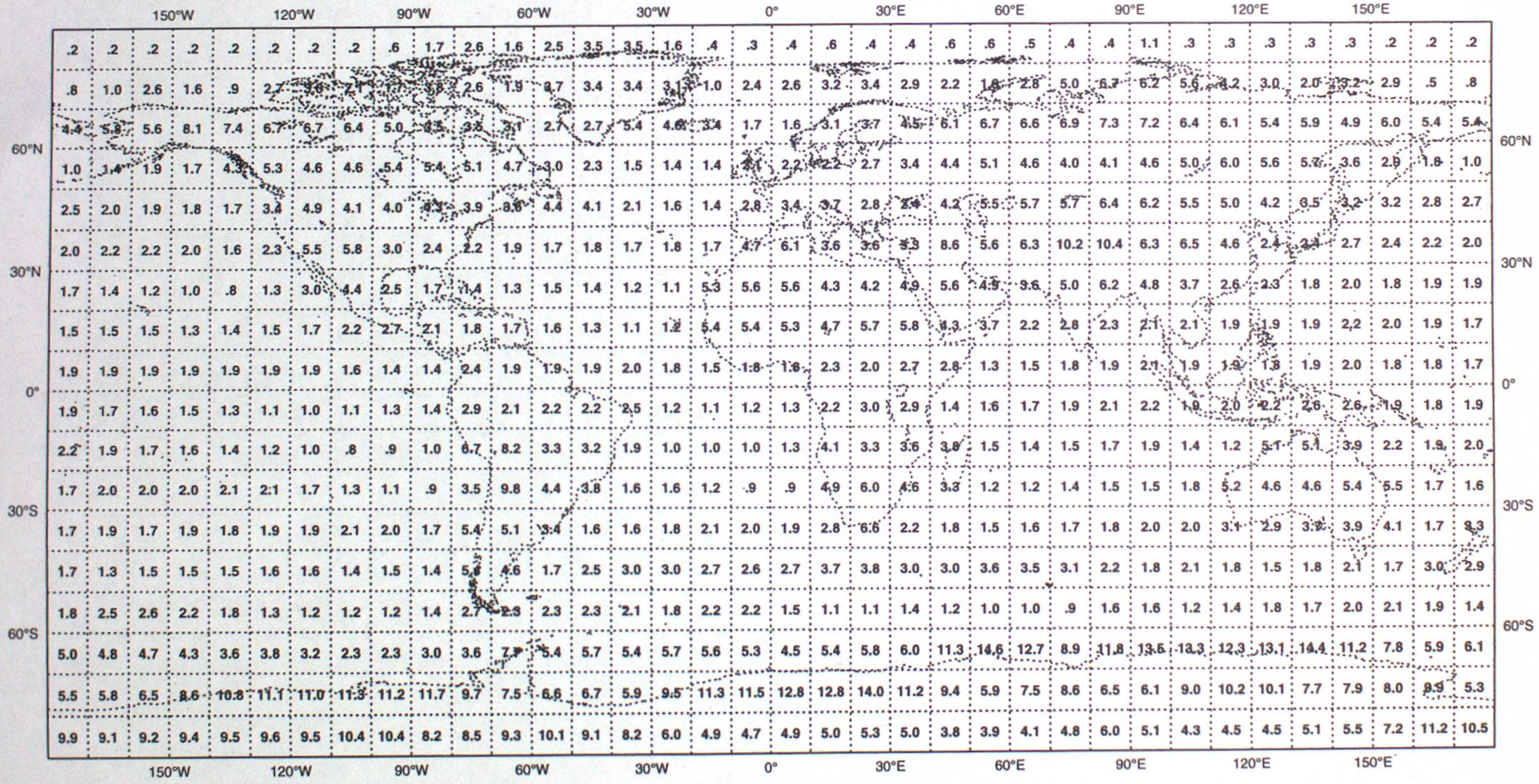
488	491	500	506	512	519	526	528	525	526	533	531	527	526	513	515	521	520	518	510	501	498	493	488	484	482	477	474	475	473	471	471	474	470	475	484
1301	1334	1361	1398	1421	1430	1433	1426	1427	1426	1435	1448	1438	1323	1309	1405	1448	1436	1417	1410	1372	1331	1303	1298	1297	1304	1321	1326	1330	1332	1326	1321	1307	1299	1298	1297
1094	1081	1124	1191	1235	1238	1227	1219	1212	1209	1218	1243	1268	1257	1277	1268	1250	1228	1215	1199	1152	1088	1050	1070	1133	1187	1223	1235	1238	1237	1228	1216	1199	1182	1155	1125
1066	992	983	1077	1159	1157	1148	1153	1143	1143	1160	1189	1210	1226	1218	1191	1155	1149	1131	1113	1050	967	950	1004	1096	1159	1172	1165	1162	1178	1183	1166	1143	1135	1131	1112
892	902	905	992	1101	1145	1124	1138	1138	1097	1116	1187	1186	1210	1186	1131	1123	1135	1095	1084	1001	902	946	1026	1096	1139	1158	1158	1151	1165	1168	1162	1112	1070	1083	977
900	964	972	1028	1077	1100	1115	1105	1119	1082	1121	1169	1164	1185	1156	1111	1126	1135	1065	1074	946	864	979	1038	1091	1115	1159	1149	1137	1168	1150	1153	1120	1054	1093	967
871	975	1051	1107	1091	1076	1115	1094	1102	1093	1122	1165	1140	1152	1134	1083	1136	1116	1056	1055	887	855	1000	1048	1096	1091	1162	1132	1134	1169	1139	1157	1109	1053	1097	1019
874	928	1031	1082	1072	1035	1116	1080	1082	1103	1109	1160	1131	1146	1136	1080	1153	1091	1062	1030	852	921	1015	1075	1088	1080	1160	1119	1143	1159	1146	1160	1124	1078	1077	1066
897	902	1028	1084	1115	1051	1115	1096	1077	1129	1130	1165	1139	1113	1096	1087	1154	1073	1088	983	840	957	1027	1099	1078	1075	1147	1113	1156	1148	1157	1148	1120	1117	1060	1098
945	871	993	1039	1076	1025	1093	1088	1057	1145	1144	1163	1156	1139	1088	1091	1126	1050	1093	928	850	975	1001	1096	1078	1096	1126	1114	1153	1140	1162	1128	1125	1142	1058	1106
981	847	954	1007	952	983	1062	1039	1035	1137	1137	1149	1159	1090	1022	1009	1051	987	941	855	837	981	1009	1041	1013	1020	1055	1084	1118	1105	1043	1010	1091	1155	1056	1080
969	840	899	1002	1038	1057	1067	998	987	1132	1108	1122	1162	1072	983	1080	1009	946	962	834	851	950	998	973	1037	912	819	932	977	952	995	970	1017	1119	1053	1043
1036	878	860	934	990	1087	1070	1084	1083	1127	1145	1128	1130	1083	1047	1112	1067	1039	993	862	930	999	1011	1031	1081	1070	1016	1070	1096	1110	1135	1125	1098	1142	1102	1051
1071	968	883	937	996	1072	1078	1103	1128	1145	1135	1172	1143	1088	1056	1074	1071	1065	979	922	996	1064	1101	1088	1120	1120	1109	1150	1169	1174	1171	1147	1135	1159	1135	1105
1096	1018	948	934	1014	1079	1115	1139	1138	1150	1176	1173	1152	1120	1086	1090	1078	1029	967	973	1060	1112	1138	1147	1162	1151	1145	1170	1190	1192	1201	1201	1184	1159	1152	1127
1175	1133	1075	1043	1063	1102	1156	1202	1209	1230	1213	1090	1148	1147	1136	1120	1035	1022	1056	1100	1165	1200	1178	1123	1150	1069	1148	1177	1168	1148	1183	1204	1223	1215	1204	1198
1212	1168	1130	1076	1053	972	1010	1075	936	870	804	791	1032	1070	1078	949	766	645	693	725	630	574	394	543	1024	1010	741	231	271	450	534	865	1171	1224	1132	1186
340	383	361	359	395	389	338	251	198	324	376	337	310	326	362	357	308	229	185	193	241	197	96	47	28	20	23	29	65	154	285	370	341	335	391	358

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



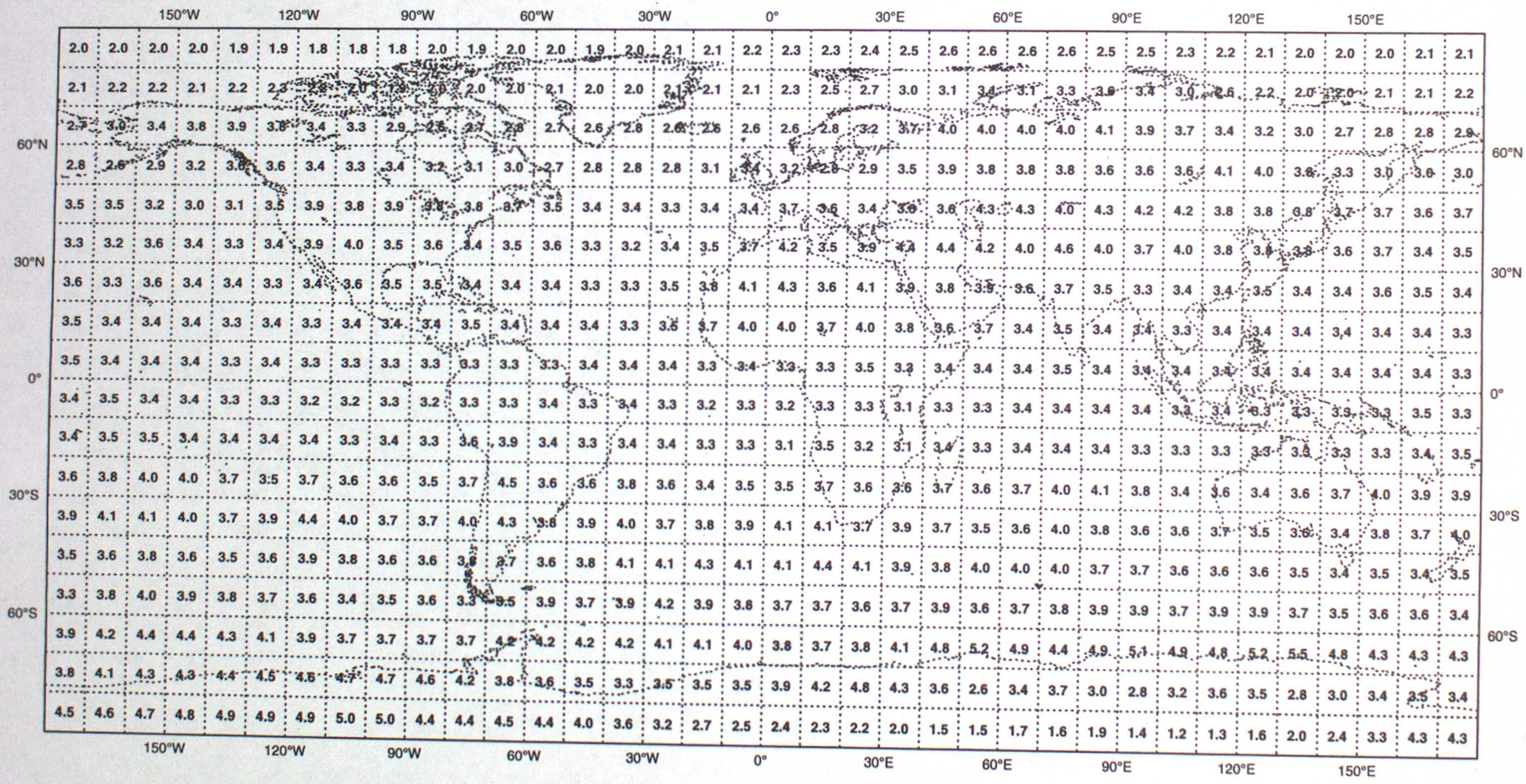
-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.3	-1.2	.2	-.9	-.2	1.2	1.1	-1.0	-1.3	-1.3	-1.2	-1.0	-1.3	-1.3	-1.0	-1.1	-1.4	-1.4	-1.4	-1.5	-1.4	-1.4	-1.3	-1.3	-1.3	-1.4	-1.4	-1.4
-1.9	-1.9	-2.4	-2.0	-1.8	-2.4	[illegible]	-1.8	1.5	[illegible]	-1.1	-.4	1.5	5.4	6.4	.5	-1.4	-2.6	-5.4	-4.7	-3.8	-3.1	-1.8	-1.8	-1.9	-3.1	-4.4	-4.6	-4.1	-3.4	-2.5	-1.8	-2.6	-2.3	-1.7	-1.8
-6.6	-9.0	-15.3	-15.5	-15.3	-13.8	-10.2	-7.6	-5.0	-2.7	-3.0	-2.4	-3.8	.6	-3.0	-6.8	-7.7	-9.2	-10.4	-11.1	-11.7	-11.6	-10.4	-11.0	-13.6	-14.8	-15.5	-13.4	-12.5	-11.6	-12.5	-10.4	-8.6	-11.8	-11.7	-11.9
-7.4	-8.0	-9.2	-10.1	-10.7	-14.6	-15.6	-13.2	-9.9	-8.0	-7.5	-8.1	-6.1	-7.6	-9.8	-11.8	-13.4	-13.5	-14.2	-14.8	-15.1	-15.7	-16.7	-18.0	-19.0	-19.3	-17.8	-17.0	-17.5	-17.6	-16.4	-12.3	-5.5	-7.2	-7.7	-7.3
-9.7	-10.1	-10.6	-11.4	-13.3	-15.4	-16.3	-16.0	-17.0	-14.9	-15.4	-12.9	-11.2	-12.4	-15.6	-16.6	-17.0	-18.0	-18.3	-18.1	-18.0	-17.8	-18.9	-24.6	-26.7	-19.9	-20.4	-20.5	-21.1	-21.6	-20.3	-16.1	-11.8	-10.0	-10.1	-10.0
-17.9	-17.3	-17.6	-18.3	-18.4	-16.9	-22.9	-22.3	-21.9	-21.3	-21.4	-21.4	-20.6	-20.2	-20.2	-20.1	-20.6	-23.3	-24.8	-22.8	-25.2	-23.3	-26.7	-25.5	-26.5	-15.1	-11.6	-9.8	-17.2	-21.6	-19.7	-19.7	-19.9	-19.8	-18.9	-18.4
-22.2	-22.6	-22.5	-22.1	-21.4	-20.7	-22.4	-24.2	-24.3	-24.2	-24.0	-23.7	-23.3	-23.2	-23.0	-22.9	-25.3	-33.3	-32.2	-31.1	-32.8	-31.9	-33.2	-32.3	-30.2	-27.4	-20.2	-17.4	-18.4	-21.6	-22.7	-22.8	-23.7	-23.0	-22.4	-22.1
-23.5	-23.7	-23.3	-23.1	-22.7	-22.8	-22.5	-22.1	-22.0	-22.7	-24.3	-23.9	-24.1	-23.5	-23.2	-23.4	-27.7	-31.7	-30.6	-30.6	-28.3	-24.8	-27.3	-27.4	-24.6	-23.0	-23.8	-21.9	-22.2	-22.9	-22.4	-22.9	-23.0	-22.9	-23.0	-23.4
-22.8	-23.1	-23.2	-23.1	-23.2	-22.6	-22.4	-21.9	-21.5	-21.2	-19.3	-19.9	-21.2	-22.4	-22.6	-22.0	-22.0	-21.9	-21.8	-21.2	-20.6	-18.8	-22.2	-24.3	-24.6	-23.7	-24.0	-23.2	-23.7	-23.0	-22.6	-22.6	-22.3	-22.1	-22.3	-22.7
-23.8	-24.6	-24.9	-25.0	-25.1	-24.9	-24.3	-23.6	-22.6	-20.8	-18.6	-21.2	-22.7	-22.5	-23.1	-24.5	-24.0	-23.3	-22.9	-21.3	-20.7	-18.1	-23.1	-23.0	-23.2	-23.3	-23.3	-23.8	-24.0	-24.1	-23.8	-22.6	-21.1	-22.0	-22.4	-23.2
-23.2	-24.5	-24.6	-24.4	-24.7	-24.7	-24.1	-23.3	-22.5	-21.2	-15.2	-16.0	-20.7	-18.5	-23.4	-24.0	-23.0	-22.2	-21.7	-17.2	-16.3	-17.8	-21.8	-23.2	-23.5	-23.4	-22.9	-23.1	-23.9	-25.1	-22.6	-20.9	-21.8	-22.9	-22.4	-22.7
-20.9	-21.0	-21.7	-21.5	-21.0	-21.5	-21.7	-21.3	-20.5	-19.4	-17.4	-6.2	-15.8	-18.1	-21.7	-21.6	-21.1	-20.2	-19.7	-14.6	-10.2	-19.7	-20.8	-21.8	-21.3	-21.1	-21.0	-20.7	-20.9	-18.0	-13.0	-11.6	-11.4	-19.6	-21.2	-20.7
-17.0	-17.1	-17.7	-17.4	-16.3	-15.9	-16.3	-16.3	-16.3	-15.8	-12.4	-6.6	-13.6	-17.4	-17.1	-17.0	-16.6	-16.3	-16.5	-16.2	-14.3	-19.0	-17.9	-17.6	-16.8	-16.3	-15.7	-15.3	-15.5	-15.8	-14.2	-13.8	-8.7	-16.9	-17.4	-16.1
-12.1	-12.2	-12.1	-11.4	-10.6	-10.2	-10.5	-10.6	-10.6	-11.0	-7.5	-7.6	-10.7	-11.4	-10.1	-8.9	-8.4	-8.3	-8.4	-8.8	-9.5	-9.3	-8.4	-9.1	-9.9	-9.1	-9.9	-9.7	-9.4	-10.1	-10.9	-11.0	-11.0	-12.4	-11.7	-9.9
-7.0	-6.5	-6.2	-6.1	-6.0	-5.7	-6.3	-6.6	-6.5	-6.7	-6.1	-5.6	-4.3	-2.9	-1.8	-1.6	-1.5	-1.3	-1.4	-1.0	-1.8	-2.4	-2.4	-2.8	-3.1	-2.4	-3.1	-3.5	-3.2	-3.8	-4.6	-4.6	-5.1	-6.5	-7.6	-7.2
1.8	2.6	2.9	1.9	.8	.5	-.6	-1.1	-1.0	-.5	.4	4.6	5.5	6.8	7.5	9.4	11.3	9.3	7.2	6.6	5.7	4.5	7.4	12.4	12.9	9.4	12.7	13.3	12.2	9.9	9.4	10.7	7.3	4.7	3.7	2.9
12.8	12.2	11.9	12.6	14.8	14.4	12.6	12.8	15.9	15.9	15.5	21.1	17.0	17.9	17.5	20.8	26.2	33.5	35.4	37.3	33.3	35.9	41.1	46.8	39.3	37.9	43.4	41.8	42.2	40.7	43.6	46.5	43.3	38.1	28.2	14.9
24.7	24.0	23.4	26.5	26.8	26.5	28.1	32.2	33.8	34.3	32.0	30.5	32.9	35.2	38.1	41.8	44.4	47.1	47.6	47.6	48.8	50.8	52.1	53.4	55.2	55.9	55.1	56.7	56.5	56.2	53.1	50.2	46.9	41.0	29.8	24.8

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations



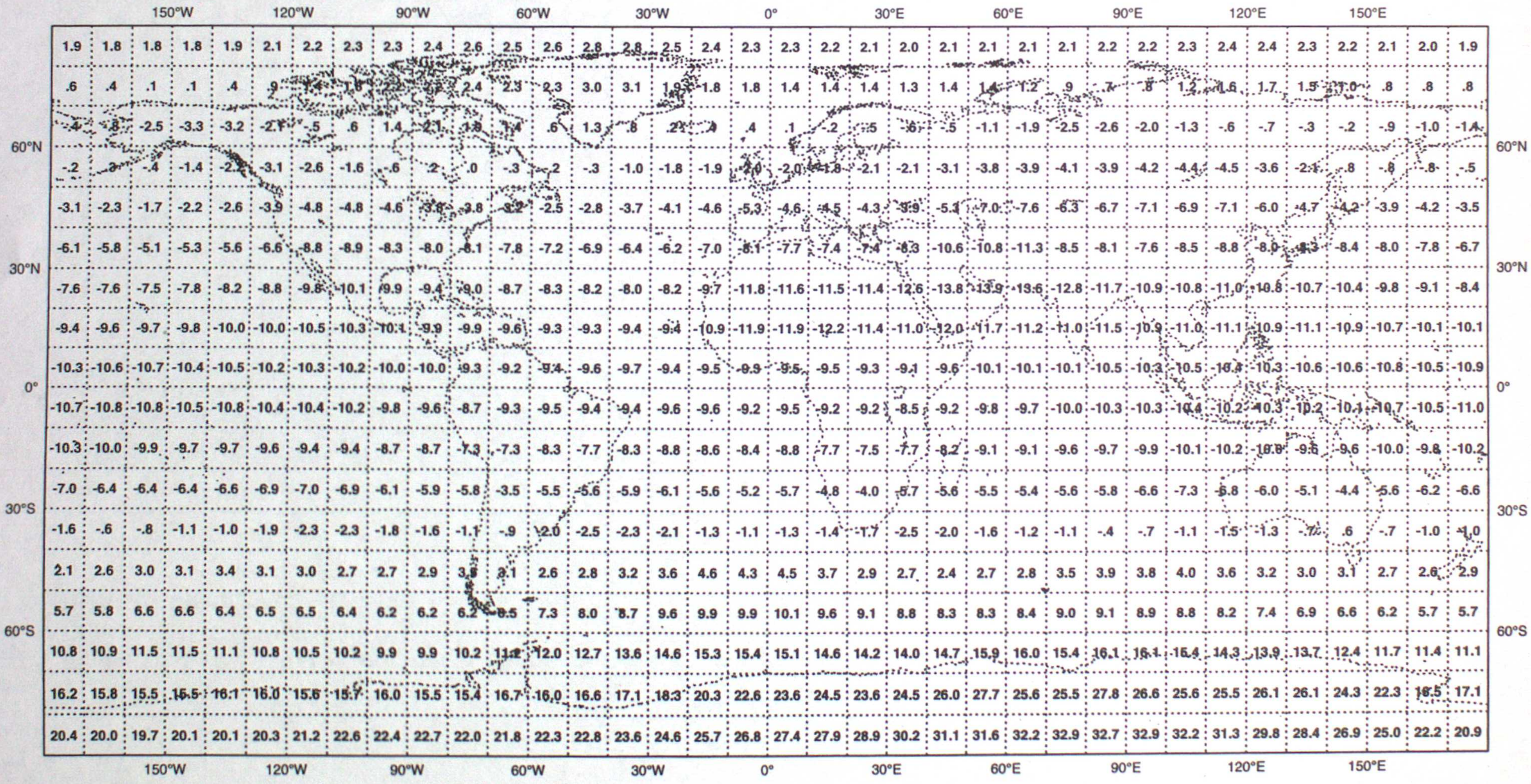
.2	.2	.2	.2	.2	.2	.2	.2	.6	1.7	2.6	1.6	2.5	3.5	3.5	1.6	.4	.3	.4	.6	.4	.4	.6	.6	.5	.4	.4	1.1	.3	.3	.3	.3	.3	.2	.2	.2
.8	1.0	2.6	1.6	.9	2.7	3.6	2.1	1.7	3.8	2.6	1.9	3.7	3.4	3.4	3.1	1.0	2.4	2.6	3.2	3.4	2.9	2.2	1.8	2.8	5.0	6.7	6.2	5.6	4.2	3.0	2.0	3.2	2.9	.5	.8
4.4	5.8	5.6	8.1	7.4	6.7	6.7	6.4	5.0	4.5	3.5	3.1	2.7	2.7	5.4	4.6	3.4	1.7	1.6	3.1	3.7	4.5	6.1	6.7	6.6	6.9	7.3	7.2	6.4	6.1	5.4	5.9	4.9	6.0	5.4	5.4
1.0	1.4	1.9	1.7	4.3	5.3	4.6	4.6	5.4	5.4	5.1	4.7	3.0	2.3	1.5	1.4	1.4	2.1	2.2	2.2	2.7	3.4	4.4	5.1	4.6	4.0	4.1	4.6	5.0	6.0	5.6	5.7	3.6	2.9	1.8	1.0
2.5	2.0	1.9	1.8	1.7	3.4	4.9	4.1	4.0	4.3	3.9	3.6	4.4	4.1	2.1	1.6	1.4	2.8	3.4	3.7	2.8	2.4	4.2	5.5	5.7	5.7	6.4	6.2	5.5	5.0	4.2	6.5	3.2	3.2	2.8	2.7
2.0	2.2	2.2	2.0	1.6	2.3	5.5	5.8	3.0	2.4	2.2	1.9	1.7	1.8	1.7	1.8	1.7	4.7	6.1	3.6	3.6	3.3	8.6	5.6	6.3	10.2	10.4	6.3	6.5	4.6	2.4	2.4	2.7	2.4	2.2	2.0
1.7	1.4	1.2	1.0	.8	1.3	3.0	4.4	2.5	1.7	1.4	1.3	1.5	1.4	1.2	1.1	5.3	5.6	5.6	4.3	4.2	4.9	5.6	4.9	3.6	5.0	6.2	4.8	3.7	2.6	2.3	1.8	2.0	1.8	1.9	1.9
1.5	1.5	1.5	1.3	1.4	1.5	1.7	2.2	2.7	2.1	1.8	1.7	1.6	1.3	1.1	1.2	5.4	5.4	5.3	4.7	5.7	5.8	4.3	3.7	2.2	2.8	2.3	2.1	2.1	1.9	1.9	1.9	2.2	2.0	1.9	1.7
1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.6	1.4	1.4	2.4	1.9	1.9	1.9	2.0	1.8	1.5	1.8	1.8	2.3	2.0	2.7	2.8	1.3	1.5	1.8	1.9	2.1	1.9	1.9	1.8	1.9	2.0	1.8	1.8	1.7
1.9	1.7	1.6	1.5	1.3	1.1	1.0	1.1	1.3	1.4	2.9	2.1	2.2	2.2	2.5	1.2	1.1	1.2	1.3	2.2	3.0	2.9	1.4	1.6	1.7	1.9	2.1	2.2	1.9	2.0	2.2	2.6	2.6	1.9	1.8	1.9
2.2	1.9	1.7	1.6	1.4	1.2	1.0	.8	.9	1.0	6.7	8.2	3.3	3.2	1.9	1.0	1.0	1.0	1.3	4.1	3.3	3.6	3.8	1.5	1.4	1.5	1.7	1.9	1.4	1.2	5.1	5.1	3.9	2.2	1.9	2.0
1.7	2.0	2.0	2.0	2.1	2.1	1.7	1.3	1.1	.9	3.5	9.8	4.4	3.8	1.6	1.6	1.2	.9	.9	4.9	6.0	4.6	3.3	1.2	1.2	1.4	1.5	1.5	1.8	5.2	4.6	4.6	5.4	5.5	1.7	1.6
1.7	1.9	1.7	1.9	1.8	1.9	1.9	2.1	2.0	1.7	5.4	5.1	3.4	1.6	1.6	1.8	2.1	2.0	1.9	2.8	6.6	2.2	1.8	1.5	1.6	1.7	1.8	2.0	2.0	3.1	2.9	3.2	3.9	4.1	1.7	8.3
1.7	1.3	1.5	1.5	1.5	1.6	1.6	1.4	1.5	1.4	5.6	4.6	1.7	2.5	3.0	3.0	2.7	2.6	2.7	3.7	3.8	3.0	3.0	3.6	3.5	3.1	2.2	1.8	2.1	1.8	1.5	1.8	2.1	1.7	3.0	2.9
1.8	2.5	2.6	2.2	1.8	1.3	1.2	1.2	1.2	1.4	2.7	2.3	2.3	2.3	2.1	1.8	2.2	2.2	1.5	1.1	1.1	1.4	1.2	1.0	1.0	.9	1.6	1.6	1.2	1.4	1.8	1.7	2.0	2.1	1.9	1.4
5.0	4.8	4.7	4.3	3.6	3.8	3.2	2.3	2.3	3.0	3.6	7.7	5.4	5.7	5.4	5.7	5.6	5.3	4.5	5.4	5.8	6.0	11.3	14.6	12.7	8.9	11.8	13.5	13.3	12.3	13.1	14.4	11.2	7.8	5.9	6.1
5.5	5.8	6.5	8.6	10.8	11.1	11.0	11.3	11.2	11.7	9.7	7.5	6.6	6.7	5.9	9.5	11.3	11.5	12.8	12.8	14.0	11.2	9.4	5.9	7.5	8.6	6.5	6.1	9.0	10.2	10.1	7.7	7.9	8.0	9.9	5.3
9.9	9.1	9.2	9.4	9.5	9.6	9.5	10.4	10.4	8.2	8.5	9.3	10.1	9.1	8.2	6.0	4.9	4.7	4.9	5.0	5.3	5.0	3.8	3.9	4.1	4.8	6.0	5.1	4.3	4.5	4.5	5.1	5.5	7.2	11.2	10.5

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	2.0	1.9	2.0	2.0	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.6	2.6	2.6	2.6	2.5	2.5	2.3	2.2	2.1	2.0	2.0	2.0	2.1	2.1
2.1	2.2	2.2	2.1	2.2	2.3	2.8	2.0	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.3	2.5	2.7	3.0	3.1	3.4	3.1	3.3	3.9	3.4	3.0	2.6	2.2	2.0	2.0	2.1	2.1	2.2
2.7	3.0	3.4	3.8	3.9	3.8	3.4	3.3	2.9	2.6	2.7	2.8	2.7	2.6	2.8	2.6	2.6	2.6	2.6	2.8	3.2	3.7	4.0	4.0	4.0	4.0	4.1	3.9	3.7	3.4	3.2	3.0	2.7	2.8	2.8	2.9
2.8	2.6	2.9	3.2	3.6	3.6	3.4	3.3	3.4	3.2	3.1	3.0	2.7	2.8	2.8	2.8	3.1	3.4	3.2	2.8	2.9	3.5	3.9	3.8	3.8	3.8	3.6	3.6	3.6	4.1	4.0	3.8	3.3	3.0	3.0	3.0
3.5	3.5	3.2	3.0	3.1	3.5	3.9	3.8	3.9	3.8	3.8	3.7	3.5	3.4	3.4	3.3	3.4	3.4	3.7	3.6	3.4	3.6	3.6	4.3	4.3	4.0	4.3	4.2	4.2	3.8	3.8	3.8	3.7	3.7	3.6	3.7
3.3	3.2	3.6	3.4	3.3	3.4	3.9	4.0	3.5	3.6	3.4	3.5	3.6	3.3	3.2	3.4	3.5	3.7	4.2	3.5	3.9	4.4	4.4	4.2	4.0	4.6	4.0	3.7	4.0	3.8	3.8	3.8	3.6	3.7	3.4	3.5
3.6	3.3	3.6	3.4	3.4	3.3	3.4	3.6	3.5	3.5	3.4	3.4	3.4	3.3	3.3	3.5	3.8	4.1	4.3	3.6	4.1	3.9	3.8	3.9	3.6	3.7	3.5	3.3	3.4	3.4	3.5	3.4	3.4	3.6	3.5	3.4
3.5	3.4	3.4	3.4	3.3	3.4	3.3	3.4	3.4	3.4	3.5	3.4	3.4	3.4	3.3	3.5	3.7	4.0	4.0	3.7	4.0	3.8	3.6	3.7	3.4	3.5	3.4	3.4	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.3
3.5	3.4	3.4	3.4	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.3	3.4	3.3	3.3	3.5	3.3	3.4	3.4	3.4	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3
3.4	3.5	3.4	3.4	3.3	3.3	3.2	3.2	3.3	3.2	3.3	3.3	3.4	3.3	3.4	3.3	3.2	3.3	3.2	3.3	3.3	3.1	3.3	3.3	3.4	3.4	3.4	3.4	3.3	3.4	3.3	3.3	3.9	3.3	3.5	3.3
3.4	3.5	3.5	3.4	3.4	3.4	3.4	3.3	3.4	3.3	3.6	3.9	3.4	3.3	3.4	3.4	3.3	3.3	3.1	3.5	3.2	3.1	3.4	3.3	3.4	3.4	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.5
3.6	3.8	4.0	4.0	3.7	3.5	3.7	3.6	3.6	3.5	3.7	4.5	3.6	3.6	3.8	3.6	3.4	3.5	3.5	3.7	3.6	3.6	3.7	3.6	3.7	4.0	4.1	3.8	3.4	3.6	3.4	3.6	3.7	4.0	3.9	3.9
3.9	4.1	4.1	4.0	3.7	3.9	4.4	4.0	3.7	3.7	4.0	4.3	3.8	3.9	4.0	3.7	3.8	3.9	4.1	4.1	3.7	3.9	3.7	3.5	3.6	4.0	3.8	3.6	3.6	3.7	3.5	3.6	3.4	3.8	3.7	4.0
3.5	3.6	3.8	3.6	3.5	3.6	3.9	3.8	3.6	3.6	3.8	3.7	3.6	3.8	4.1	4.1	4.3	4.1	4.1	4.4	4.1	3.9	3.8	4.0	4.0	4.0	3.7	3.7	3.6	3.6	3.6	3.5	3.4	3.5	3.4	3.5
3.3	3.8	4.0	3.9	3.8	3.7	3.6	3.4	3.5	3.6	3.3	3.5	3.9	3.7	3.9	4.2	3.9	3.8	3.7	3.7	3.6	3.7	3.9	3.6	3.7	3.8	3.9	3.9	3.7	3.9	3.9	3.7	3.5	3.6	3.6	3.4
3.9	4.2	4.4	4.4	4.3	4.1	3.9	3.7	3.7	3.7	3.7	4.2	4.2	4.2	4.2	4.1	4.1	4.0	3.8	3.7	3.8	4.1	4.8	5.2	4.9	4.4	4.9	5.1	4.9	4.8	5.2	5.5	4.8	4.3	4.3	4.3
3.8	4.1	4.3	4.3	4.4	4.5	4.6	4.7	4.7	4.6	4.2	3.8	3.6	3.5	3.3	3.5	3.5	3.5	3.9	4.2	4.8	4.3	3.6	2.6	3.4	3.7	3.0	2.8	3.2	3.6	3.5	2.8	3.0	3.4	3.5	3.4
4.5	4.6	4.7	4.8	4.9	4.9	4.9	5.0	5.0	4.4	4.4	4.5	4.4	4.0	3.6	3.2	2.7	2.5	2.4	2.3	2.2	2.0	1.5	1.5	1.7	1.6	1.9	1.4	1.2	1.3	1.6	2.0	2.4	3.3	4.3	4.3

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



1.9	1.8	1.8	1.8	1.9	2.1	2.2	2.3	2.3	2.4	2.6	2.5	2.6	2.8	2.8	2.5	2.4	2.3	2.3	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.3	2.4	2.4	2.3	2.2	2.1	2.0	1.9
.6	.4	.1	.1	.4	.9	1.4	1.8	2.2	2.2	2.4	2.3	2.3	3.0	3.1	1.9	1.8	1.8	1.4	1.4	1.4	1.3	1.4	1.4	1.2	.9	.7	.8	1.2	1.6	1.7	1.5	1.0	.8	.8	.8
-.4	-.8	-2.5	-3.3	-3.2	-2.1	-.5	.6	1.4	-2.1	1.8	1.4	.6	1.3	.8	.2	.4	.4	.1	-.2	-.5	-.6	-.5	-1.1	-1.9	-2.5	-2.6	-2.0	-1.3	-.6	-.7	-.3	-.2	-.9	-1.0	-1.4
-.2	-.3	-.4	-1.4	-2.2	-3.1	-2.6	-1.6	-.6	.2	.0	-.3	-.2	-.3	-1.0	-1.8	-1.9	-2.0	-2.0	-1.8	-2.1	-2.1	-3.1	-3.8	-3.9	-4.1	-3.9	-4.2	-4.4	-4.5	-3.6	-2.1	-.8	-.8	-.8	-.5
-3.1	-2.3	-1.7	-2.2	-2.6	-3.9	-4.8	-4.8	-4.6	-3.8	-3.8	-3.2	-2.5	-2.8	-3.7	-4.1	-4.6	-5.3	-4.6	-4.5	-4.3	-3.9	-5.1	-7.0	-7.6	-6.3	-6.7	-7.1	-6.9	-7.1	-6.0	-4.7	-4.2	-3.9	-4.2	-3.5
-6.1	-5.8	-5.1	-5.3	-5.6	-6.6	-8.8	-8.9	-8.3	-8.0	-8.1	-7.8	-7.2	-6.9	-6.4	-6.2	-7.0	-8.1	-7.7	-7.4	-7.4	-8.3	-10.6	-10.8	-11.3	-8.5	-8.1	-7.6	-8.5	-8.8	-8.0	-8.3	-8.4	-8.0	-7.8	-6.7
-7.6	-7.6	-7.5	-7.8	-8.2	-8.8	-9.8	-10.1	-9.9	-9.4	-9.0	-8.7	-8.3	-8.2	-8.0	-8.2	-9.7	-11.8	-11.6	-11.5	-11.4	-12.6	-13.8	-13.9	-13.6	-12.8	-11.7	-10.9	-10.8	-11.0	-10.8	-10.7	-10.4	-9.8	-9.1	-8.4
-9.4	-9.6	-9.7	-9.8	-10.0	-10.0	-10.5	-10.3	-10.1	-9.9	-9.9	-9.6	-9.3	-9.3	-9.4	-9.4	-10.9	-11.9	-11.9	-12.2	-11.4	-11.0	-12.0	-11.7	-11.2	-11.0	-11.5	-10.9	-11.0	-11.1	-10.9	-11.1	-10.9	-10.7	-10.1	-10.1
-10.3	-10.6	-10.7	-10.4	-10.5	-10.2	-10.3	-10.2	-10.0	-10.0	-9.3	-9.2	-9.4	-9.6	-9.7	-9.4	-9.5	-9.9	-9.5	-9.5	-9.3	-9.1	-9.6	-10.1	-10.1	-10.1	-10.5	-10.3	-10.5	-10.4	-10.3	-10.6	-10.6	-10.8	-10.5	-10.9
-10.7	-10.8	-10.8	-10.5	-10.8	-10.4	-10.4	-10.2	-9.8	-9.6	-8.7	-9.3	-9.5	-9.4	-9.4	-9.6	-9.6	-9.2	-9.5	-9.2	-9.2	-8.5	-9.2	-9.8	-9.7	-10.0	-10.3	-10.3	-10.4	-10.2	-10.3	-10.2	-10.1	-10.7	-10.5	-11.0
-10.3	-10.0	-9.9	-9.7	-9.7	-9.6	-9.4	-9.4	-8.7	-8.7	-7.3	-7.3	-8.3	-7.7	-8.3	-8.8	-8.6	-8.4	-8.8	-7.7	-7.5	-7.7	-8.2	-9.1	-9.1	-9.6	-9.7	-9.9	-10.1	-10.2	-10.0	-9.6	-9.6	-10.0	-9.8	-10.2
-7.0	-6.4	-6.4	-6.4	-6.6	-6.9	-7.0	-6.9	-6.1	-5.9	-5.8	-3.5	-5.5	-5.6	-5.9	-6.1	-5.6	-5.2	-5.7	-4.8	-4.0	-5.7	-5.6	-5.5	-5.4	-5.6	-5.8	-6.6	-7.3	-6.8	-6.0	-5.1	-4.4	-5.6	-6.2	-6.6
-1.6	-.6	-.8	-1.1	-1.0	-1.9	-2.3	-2.3	-1.8	-1.6	-1.1	-.9	-2.0	-2.5	-2.3	-2.1	-1.3	-1.1	-1.3	-1.4	-1.7	-2.5	-2.0	-1.6	-1.2	-1.1	-.4	-.7	-1.1	-1.5	-1.3	-.7	.6	-.7	-1.0	-1.0
2.1	2.6	3.0	3.1	3.4	3.1	3.0	2.7	2.7	2.9	3.8	3.1	2.6	2.8	3.2	3.6	4.6	4.3	4.5	3.7	2.9	2.7	2.4	2.7	2.8	3.5	3.9	3.8	4.0	3.6	3.2	3.0	3.1	2.7	2.6	2.9
5.7	5.8	6.6	6.6	6.4	6.5	6.5	6.4	6.2	6.2	6.2	8.5	7.3	8.0	8.7	9.6	9.9	9.9	10.1	9.6	9.1	8.8	8.3	8.3	8.4	9.0	9.1	8.9	8.8	8.2	7.4	6.9	6.6	6.2	5.7	5.7
10.8	10.9	11.5	11.5	11.1	10.8	10.5	10.2	9.9	9.9	10.2	11.2	12.0	12.7	13.6	14.6	15.3	15.4	15.1	14.6	14.2	14.0	14.7	15.9	16.0	15.4	16.1	16.1	15.4	14.3	13.9	13.7	12.4	11.7	11.4	11.1
16.2	15.8	15.5	15.5	16.1	16.0	15.6	15.7	16.0	15.5	15.4	16.7	16.0	16.6	17.1	18.3	20.3	22.6	23.6	24.5	23.6	24.5	26.0	27.7	25.6	25.5	27.8	26.6	25.6	25.5	26.1	26.1	24.3	22.3	18.5	17.1
20.4	20.0	19.7	20.1	20.1	20.3	21.2	22.6	22.4	22.7	22.0	21.8	22.3	22.8	23.6	24.6	25.7	26.8	27.4	27.9	28.9	30.2	31.1	31.6	32.2	32.9	32.7	32.9	32.2	31.3	29.8	28.4	26.9	25.0	22.2	20.9

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

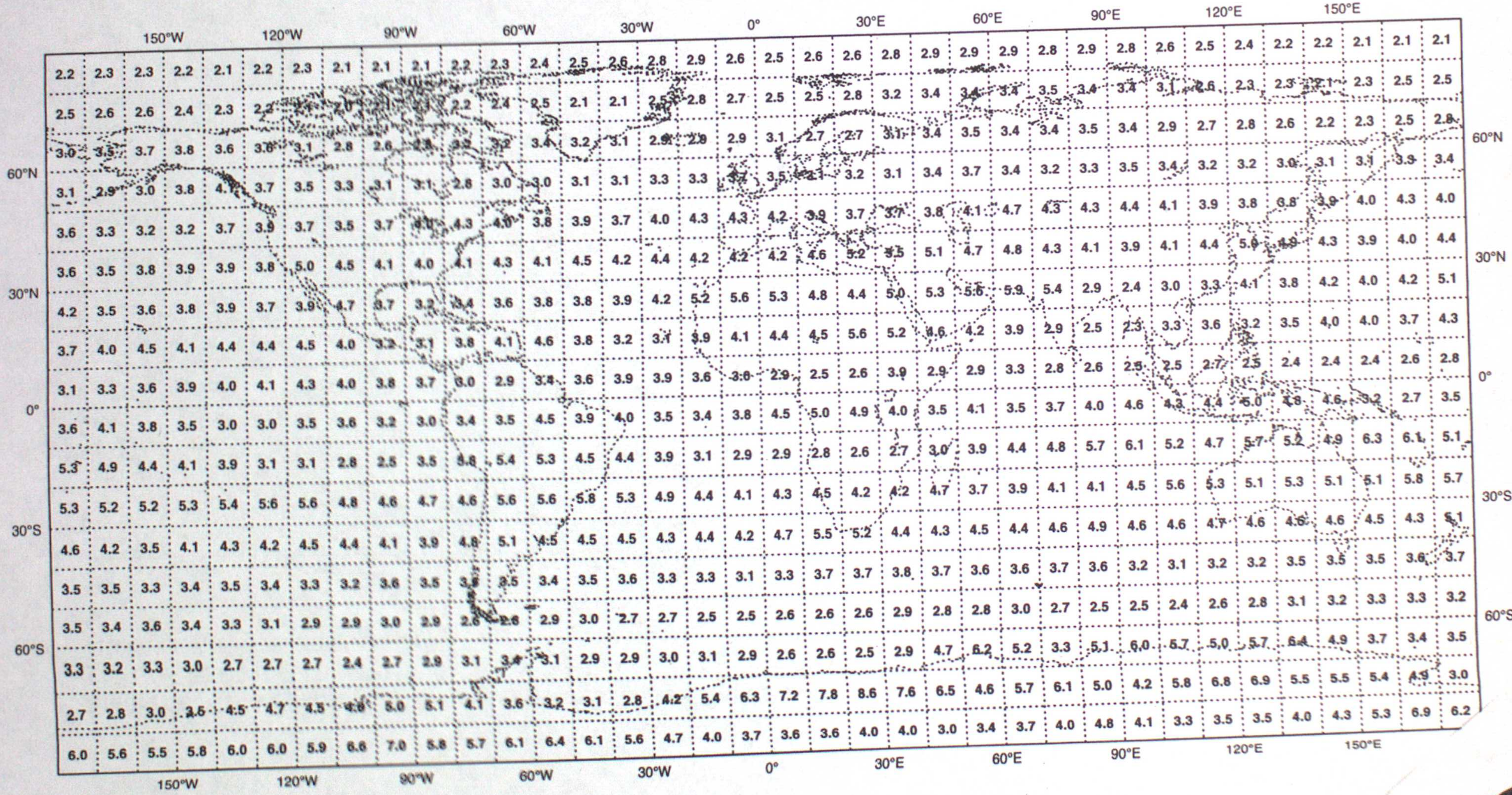
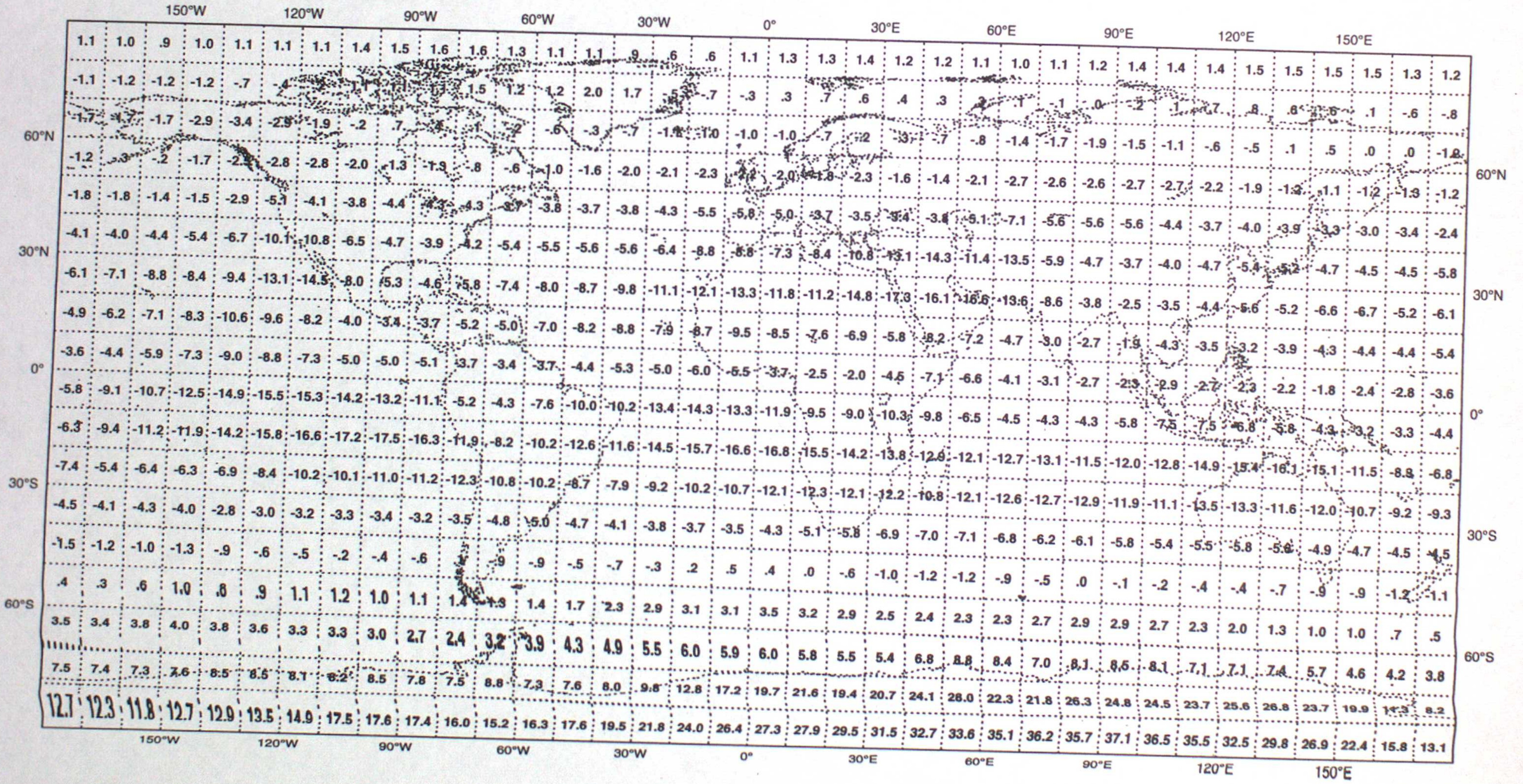
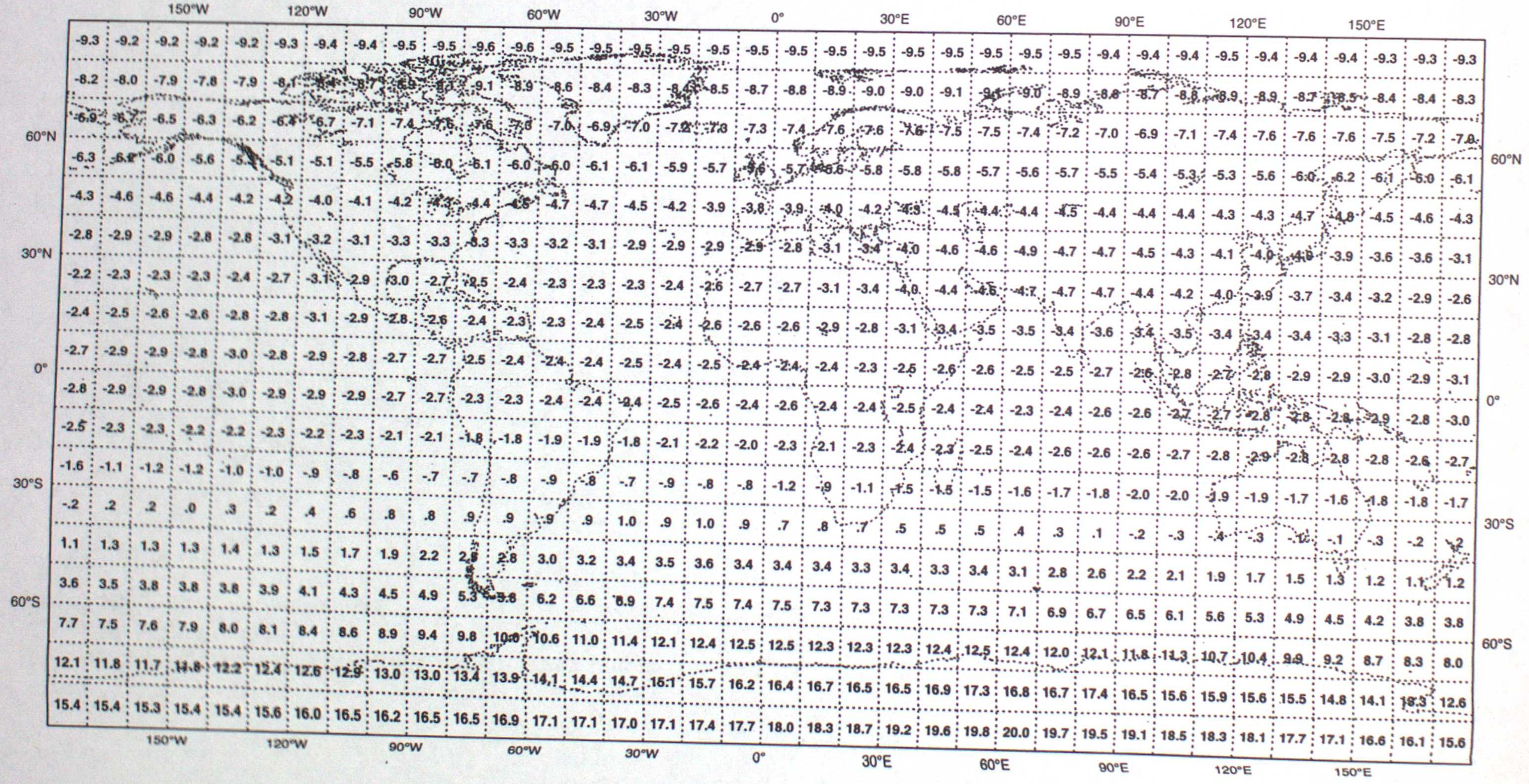

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.2 2.3 2.3 2.2 2.1 2.2 2.3 2.1 2.1 2.1 2.2 2.3 2.4 2.5 2.6 2.8 2.9 2.6 2.5 2.6 2.6 2.8 2.9 2.9 2.9 2.8 2.9 2.8 2.6 2.5 2.4 2.2 2.2 2.1 2.1 2.1
2.5 2.6 2.6 2.4 2.3 2.2 2.1 2.0 2.1 2.1 2.2 2.4 2.5 2.1 2.1 2.5 2.8 2.7 2.5 2.5 2.8 3.2 3.4 3.4 3.4 3.5 3.4 3.4 3.1 2.6 2.3 2.3 2.1 2.3 2.5 2.5
3.0 3.5 3.7 3.8 3.6 3.6 3.1 2.8 2.6 2.8 3.2 3.2 3.4 3.2 3.1 2.9 2.8 2.9 3.1 2.7 2.7 3.1 3.4 3.5 3.4 3.4 3.5 3.4 2.9 2.7 2.8 2.6 2.2 2.3 2.5 2.8
3.1 2.9 3.0 3.8 4.1 3.7 3.5 3.3 3.1 3.1 2.8 3.0 3.0 3.1 3.1 3.3 3.3 3.7 3.5 2.1 3.2 3.1 3.4 3.7 3.4 3.2 3.3 3.5 3.4 3.2 3.2 3.0 3.1 3.1 3.3 3.4
3.6 3.3 3.2 3.2 3.7 3.9 3.7 3.5 3.7 4.0 4.3 4.0 3.8 3.9 3.7 4.0 4.3 4.3 4.2 3.9 3.7 3.7 3.8 4.1 4.7 4.3 4.3 4.4 4.1 3.9 3.8 3.8 3.9 4.0 4.3 4.0
3.6 3.5 3.8 3.9 3.9 3.8 5.0 4.5 4.1 4.0 4.1 4.3 4.1 4.5 4.2 4.4 4.2 4.2 4.2 4.6 5.2 3.5 5.1 4.7 4.8 4.3 4.1 3.9 4.1 4.4 5.0 4.9 4.3 3.9 4.0 4.4
4.2 3.5 3.6 3.8 3.9 3.7 3.9 4.7 3.7 3.2 3.4 3.6 3.8 3.8 3.9 4.2 5.2 5.6 5.3 4.8 4.4 5.0 5.3 5.6 5.9 5.4 2.9 2.4 3.0 3.3 4.1 3.8 4.2 4.0 4.2 5.1
3.7 4.0 4.5 4.1 4.4 4.4 4.5 4.0 3.2 3.1 3.8 4.1 4.6 3.8 3.2 3.1 3.9 4.1 4.4 4.5 5.6 5.2 4.6 4.2 3.9 2.9 2.5 2.3 3.3 3.6 3.2 3.5 4.0 4.0 3.7 4.3
3.1 3.3 3.6 3.9 4.0 4.1 4.3 4.0 3.8 3.7 3.0 2.9 3.4 3.6 3.9 3.9 3.6 3.6 2.9 2.5 2.6 3.9 2.9 2.9 3.3 2.8 2.6 2.5 2.5 2.7 2.5 2.4 2.4 2.4 2.6 2.8
3.6 4.1 3.8 3.5 3.0 3.0 3.5 3.6 3.2 3.0 3.4 3.5 4.5 3.9 4.0 3.5 3.4 3.8 4.5 5.0 4.9 4.0 3.5 4.1 3.5 3.7 4.0 4.6 4.3 4.4 5.0 4.8 4.6 3.2 2.7 3.5
5.3 4.9 4.4 4.1 3.9 3.1 3.1 2.8 2.5 3.5 5.8 5.4 5.3 4.5 4.4 3.9 3.1 2.9 2.9 2.8 2.6 2.7 3.0 3.9 4.4 4.8 5.7 6.1 5.2 4.7 5.7 5.2 4.9 6.3 6.1 5.1
5.3 5.2 5.2 5.3 5.4 5.6 5.6 4.8 4.6 4.7 4.6 5.6 5.6 5.8 5.3 4.9 4.4 4.1 4.3 4.5 4.2 4.2 4.7 3.7 3.9 4.1 4.1 4.5 5.6 5.3 5.1 5.3 5.1 5.1 5.8 5.7
4.6 4.2 3.5 4.1 4.3 4.2 4.5 4.4 4.1 3.9 4.8 5.1 4.5 4.5 4.5 4.3 4.4 4.2 4.7 5.5 5.2 4.4 4.3 4.5 4.4 4.6 4.9 4.6 4.6 4.7 4.6 4.6 4.6 4.5 4.3 5.1
3.5 3.5 3.3 3.4 3.5 3.4 3.3 3.2 3.6 3.5 3.8 3.5 3.4 3.5 3.6 3.3 3.3 3.1 3.3 3.7 3.7 3.8 3.7 3.6 3.6 3.7 3.6 3.2 3.1 3.2 3.2 3.5 3.5 3.5 3.6 3.7
3.5 3.4 3.6 3.4 3.3 3.1 2.9 2.9 3.0 2.9 2.6 2.6 2.9 3.0 2.7 2.7 2.5 2.5 2.6 2.6 2.6 2.9 2.8 2.8 3.0 2.7 2.5 2.5 2.4 2.6 2.8 3.1 3.2 3.3 3.3 3.2
3.3 3.2 3.3 3.0 2.7 2.7 2.7 2.4 2.7 2.9 3.1 3.4 3.1 2.9 2.9 3.0 3.1 2.9 2.6 2.6 2.5 2.9 4.7 6.2 5.2 3.3 5.1 6.0 5.7 5.0 5.7 6.4 4.9 3.7 3.4 3.5
2.7 2.8 3.0 3.5 4.5 4.7 4.5 4.8 5.0 5.1 4.1 3.6 3.2 3.1 2.8 4.2 5.4 6.3 7.2 7.8 8.6 7.6 6.5 4.6 5.7 6.1 5.0 4.2 5.8 6.8 6.9 5.5 5.5 5.4 4.9 3.0
6.0 5.6 5.5 5.8 6.0 6.0 5.9 6.6 7.0 5.8 5.7 6.1 6.4 6.1 5.6 4.7 4.0 3.7 3.6 3.6 4.0 4.0 3.0 3.4 3.7 4.0 4.8 4.1 3.3 3.5 3.5 4.0 4.3 5.3 6.9 6.2

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



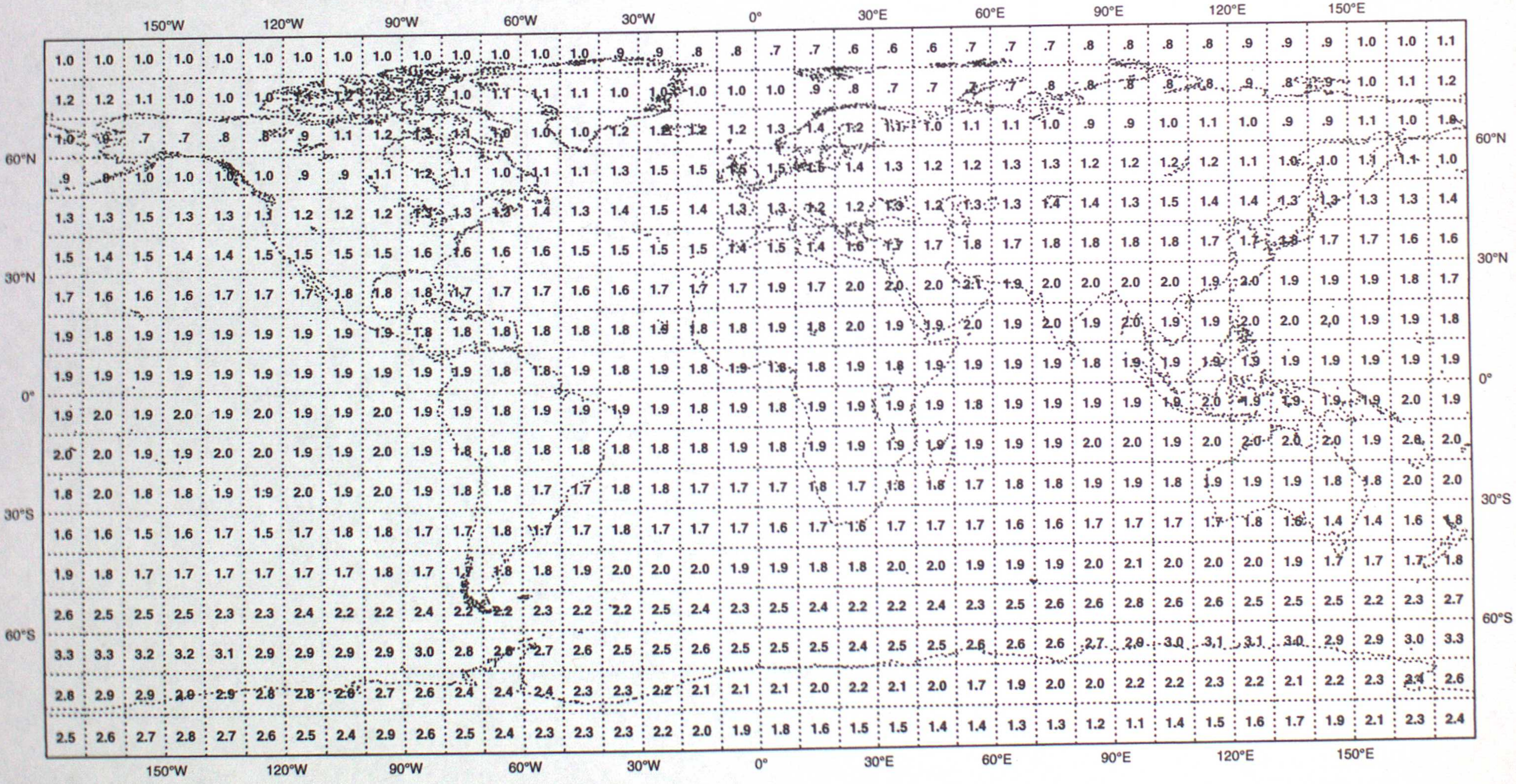
1.1	1.0	.9	1.0	1.1	1.1	1.1	1.4	1.5	1.6	1.6	1.3	1.1	1.1	.9	.6	.6	1.1	1.3	1.3	1.4	1.2	1.2	1.1	1.0	1.1	1.2	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.3	1.2
-1.1	-1.2	-1.2	-1.2	-.7	-.4	[illegible]	1.1	1.1	[illegible]	1.5	1.2	1.2	2.0	1.7	-.5	-.7	-.3	.3	.7	.6	.4	.3	.2	.1	-.1	-.0	-.2	.1	.7	.8	.6	.6	.1	-.6	-.8
-1.7	-1.7	-1.7	-2.9	-3.4	-2.9	-1.9	-.2	.7	.4	.1	-.2	-.6	-.3	-.7	-1.1	-1.0	-1.0	-1.0	-.7	.2	-.3	-.7	-.8	-1.4	-1.7	-1.9	-1.5	-1.1	-.6	-.5	.1	.5	.0	.0	-1.2
-1.2	-.3	-.2	-1.7	-2.2	-2.8	-2.8	-2.0	-1.3	-1.9	-.8	-.6	-1.0	-1.6	-2.0	-2.1	-2.3	-2.2	-2.0	-1.8	-2.3	-1.6	-1.4	-2.1	-2.7	-2.6	-2.6	-2.7	-2.7	-2.2	-1.9	-1.2	-1.1	-1.2	-1.3	-1.2
-1.8	-1.8	-1.4	-1.5	-2.9	-5.1	-4.1	-3.8	-4.4	-4.3	-4.3	-3.7	-3.8	-3.7	-3.8	-4.3	-5.5	-5.8	-5.0	-3.7	-3.5	-3.4	-3.8	-5.1	-7.1	-5.6	-5.6	-5.6	-4.4	-3.7	-4.0	-3.9	-3.3	-3.0	-3.4	-2.4
-4.1	-4.0	-4.4	-5.4	-6.7	-10.1	-10.8	-6.5	-4.7	-3.9	-4.2	-5.4	-5.5	-5.6	-5.6	-6.4	-8.8	-8.8	-7.3	-8.4	-10.8	-13.1	-14.3	-11.4	-13.5	-5.9	-4.7	-3.7	-4.0	-4.7	-5.4	-5.2	-4.7	-4.5	-4.5	-5.8
-6.1	-7.1	-8.8	-8.4	-9.4	-13.1	-14.5	-8.0	-5.3	-4.6	-5.8	-7.4	-8.0	-8.7	-9.8	-11.1	-12.1	-13.3	-11.8	-11.2	-14.8	-17.3	-16.1	-16.6	-13.6	-8.6	-3.8	-2.5	-3.5	-4.4	-5.6	-5.2	-6.6	-6.7	-5.2	-6.1
-4.9	-6.2	-7.1	-8.3	-10.6	-9.6	-8.2	-4.0	-3.4	-3.7	-5.2	-5.0	-7.0	-8.2	-8.8	-7.9	-8.7	-9.5	-8.5	-7.6	-6.9	-5.8	-8.2	-7.2	-4.7	-3.0	-2.7	-1.9	-4.3	-3.5	-3.2	-3.9	-4.3	-4.4	-4.4	-5.4
-3.6	-4.4	-5.9	-7.3	-9.0	-8.8	-7.3	-5.0	-5.0	-5.1	-3.7	-3.4	-3.7	-4.4	-5.3	-5.0	-6.0	-6.5	-3.7	-2.5	-2.0	-4.5	-7.1	-6.6	-4.1	-3.1	-2.7	-2.3	-2.9	-2.7	-2.3	-2.2	-1.8	-2.4	-2.8	-3.6
-5.8	-9.1	-10.7	-12.5	-14.9	-15.5	-15.3	-14.2	-13.2	-11.1	-5.2	-4.3	-7.6	-10.0	-10.2	-13.4	-14.3	-13.3	-11.9	-9.5	-9.0	-10.3	-9.8	-6.5	-4.5	-4.3	-4.3	-5.8	-7.5	-7.5	-6.8	-5.8	-4.3	-3.2	-3.3	-4.4
-6.3	-9.4	-11.2	-11.9	-14.2	-15.8	-16.6	-17.2	-17.5	-16.3	-11.9	-8.2	-10.2	-12.6	-11.6	-14.5	-15.7	-16.6	-16.8	-15.5	-14.2	-13.8	-12.9	-12.1	-12.7	-13.1	-11.5	-12.0	-12.8	-14.9	-15.4	-16.1	-15.1	-11.5	-8.8	-6.8
-7.4	-5.4	-6.4	-6.3	-6.9	-8.4	-10.2	-10.1	-11.0	-11.2	-12.3	-10.8	-10.2	-8.7	-7.9	-9.2	-10.2	-10.7	-12.1	-12.3	-12.1	-12.2	-10.8	-12.1	-12.6	-12.7	-12.9	-11.9	-11.1	-13.5	-13.3	-11.6	-12.0	-10.7	-9.2	-9.3
-4.5	-4.1	-4.3	-4.0	-2.8	-3.0	-3.2	-3.3	-3.4	-3.2	-3.5	-4.8	-5.0	-4.7	-4.1	-3.8	-3.7	-3.5	-4.3	-5.1	-5.8	-6.9	-7.0	-7.1	-6.8	-6.2	-6.1	-5.8	-5.4	-5.5	-5.8	-5.6	-4.9	-4.7	-4.5	-4.5
-1.5	-1.2	-1.0	-1.3	-.9	-.6	-.5	-.2	-.4	-.6	[illegible]	-.9	-.9	-.5	-.7	-.3	.2	.5	.4	.0	-.6	-1.0	-1.2	-1.2	-.9	-.5	.0	-.1	-.2	-.4	-.4	-.7	-.9	-.9	-1.2	-1.1
.4	.3	.6	1.0	.8	.9	1.1	1.2	1.0	1.1	1.4	1.3	1.4	1.7	2.3	2.9	3.1	3.1	3.5	3.2	2.9	2.5	2.4	2.3	2.3	2.7	2.9	2.9	2.7	2.3	2.0	1.3	1.0	1.0	.7	.5
3.5	3.4	3.8	4.0	3.8	3.6	3.3	3.3	3.0	2.7	2.4	3.2	3.9	4.3	4.9	5.5	6.0	5.9	6.0	5.8	5.5	5.4	6.8	8.8	8.4	7.0	8.1	8.5	8.1	7.1	7.1	7.4	5.7	4.6	4.2	3.8
7.5	7.4	7.3	7.6	8.5	8.5	8.1	8.2	8.5	7.8	7.5	8.8	7.3	7.6	8.0	9.8	12.8	17.2	19.7	21.6	19.4	20.7	24.1	28.0	22.3	21.8	26.3	24.8	24.5	23.7	25.6	26.8	23.7	19.9	14.3	8.2
12.7	12.3	11.8	12.7	12.9	13.5	14.9	17.5	17.6	17.4	16.0	15.2	16.3	17.6	19.5	21.8	24.0	26.4	27.3	27.9	29.5	31.5	32.7	33.6	35.1	36.2	35.7	37.1	36.5	35.5	32.5	29.8	26.9	22.4	15.8	13.1

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



-9.3	-9.2	-9.2	-9.2	-9.2	-9.3	-9.4	-9.4	-9.5	-9.5	-9.6	-9.6	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.4	-9.4	-9.4	-9.5	-9.4	-9.4	-9.4	-9.3	-9.3	-9.3
-8.2	-8.0	-7.9	-7.8	-7.9	-8.1	-8.4	-8.7	-8.9	-9.1	-9.1	-8.9	-8.6	-8.4	-8.3	-8.4	-8.5	-8.7	-8.8	-8.9	-9.0	-9.0	-9.1	-9.1	-9.0	-8.9	-8.8	-8.7	-8.8	-8.9	-8.9	-8.7	-8.5	-8.4	-8.4	-8.3
-6.9	-6.7	-6.5	-6.3	-6.2	-6.4	-6.7	-7.1	-7.4	-7.6	-7.6	-7.8	-7.0	-6.9	-7.0	-7.2	-7.3	-7.3	-7.4	-7.6	-7.6	-7.6	-7.5	-7.5	-7.4	-7.2	-7.0	-6.9	-7.1	-7.4	-7.6	-7.6	-7.6	-7.5	-7.2	-7.0
-6.3	-6.2	-6.0	-5.6	-5.3	-5.1	-5.1	-5.5	-5.8	-6.0	-6.1	-6.0	-6.0	-6.1	-6.1	-5.9	-5.7	-5.6	-5.7	-5.6	-5.8	-5.8	-5.8	-5.7	-5.6	-5.7	-5.5	-5.4	-5.3	-5.3	-5.6	-6.0	-6.2	-6.1	-6.0	-6.1
-4.3	-4.6	-4.6	-4.4	-4.2	-4.2	-4.0	-4.1	-4.2	-4.3	-4.4	-4.5	-4.7	-4.7	-4.5	-4.2	-3.9	-3.8	-3.9	-4.0	-4.2	-4.3	-4.5	-4.4	-4.4	-4.5	-4.4	-4.4	-4.4	-4.3	-4.3	-4.7	-4.8	-4.5	-4.6	-4.3
-2.8	-2.9	-2.9	-2.8	-2.8	-3.1	-3.2	-3.1	-3.3	-3.3	-3.3	-3.3	-3.2	-3.1	-2.9	-2.9	-2.9	-2.9	-2.8	-3.1	-3.4	-4.0	-4.6	-4.6	-4.9	-4.7	-4.7	-4.5	-4.3	-4.1	-4.0	-4.0	-3.9	-3.6	-3.6	-3.1
-2.2	-2.3	-2.3	-2.3	-2.4	-2.7	-3.1	-2.9	-3.0	-2.7	-2.5	-2.4	-2.3	-2.3	-2.3	-2.4	-2.6	-2.7	-2.7	-3.1	-3.4	-4.0	-4.4	-4.6	-4.7	-4.7	-4.7	-4.4	-4.2	-4.0	-3.9	-3.7	-3.4	-3.2	-2.9	-2.6
-2.4	-2.5	-2.6	-2.6	-2.8	-2.8	-3.1	-2.9	-2.8	-2.6	-2.4	-2.3	-2.3	-2.4	-2.5	-2.4	-2.6	-2.6	-2.6	-2.9	-2.8	-3.1	-3.4	-3.5	-3.5	-3.4	-3.6	-3.4	-3.5	-3.4	-3.4	-3.4	-3.3	-3.1	-2.8	-2.8
-2.7	-2.9	-2.9	-2.8	-3.0	-2.8	-2.9	-2.8	-2.7	-2.7	-2.5	-2.4	-2.4	-2.4	-2.5	-2.4	-2.5	-2.4	-2.4	-2.4	-2.3	-2.5	-2.6	-2.6	-2.5	-2.5	-2.7	-2.6	-2.8	-2.7	-2.8	-2.9	-2.9	-3.0	-2.9	-3.1
-2.8	-2.9	-2.9	-2.8	-3.0	-2.9	-2.9	-2.9	-2.7	-2.7	-2.3	-2.3	-2.4	-2.4	-2.4	-2.5	-2.6	-2.4	-2.6	-2.4	-2.4	-2.5	-2.4	-2.4	-2.3	-2.4	-2.6	-2.6	-2.7	-2.7	-2.8	-2.8	-2.8	-2.9	-2.8	-3.0
-2.5	-2.3	-2.3	-2.2	-2.2	-2.3	-2.2	-2.3	-2.1	-2.1	-1.8	-1.8	-1.9	-1.9	-1.8	-2.1	-2.2	-2.0	-2.3	-2.1	-2.3	-2.4	-2.3	-2.5	-2.4	-2.6	-2.6	-2.6	-2.7	-2.8	-2.9	-2.8	-2.8	-2.8	-2.6	-2.7
-1.6	-1.1	-1.2	-1.2	-1.0	-1.0	-.9	-.8	-.6	-.7	-.7	-.8	-.9	-.8	-.7	-.9	-.8	-.8	-1.2	-.9	-1.1	-1.5	-1.5	-1.5	-1.6	-1.7	-1.8	-2.0	-2.0	-1.9	-1.9	-1.7	-1.6	-1.8	-1.8	-1.7
-.2	.2	.2	.0	.3	.2	.4	.6	.8	.8	.9	.9	.9	.9	1.0	.9	1.0	.9	.7	.8	.7	.5	.5	.5	.4	.3	.1	-.2	-.3	-.4	-.3	-.1	-.1	-.3	-.2	.2
1.1	1.3	1.3	1.3	1.4	1.3	1.5	1.7	1.9	2.2	2.6	2.8	3.0	3.2	3.4	3.5	3.6	3.4	3.4	3.4	3.3	3.4	3.3	3.4	3.1	2.8	2.6	2.2	2.1	1.9	1.7	1.5	1.3	1.2	1.1	1.2
3.6	3.5	3.8	3.8	3.8	3.9	4.1	4.3	4.5	4.9	5.3	5.8	6.2	6.6	6.9	7.4	7.5	7.4	7.5	7.3	7.3	7.3	7.3	7.3	7.1	6.9	6.7	6.5	6.1	5.6	5.3	4.9	4.5	4.2	3.8	3.8
7.7	7.5	7.6	7.9	8.0	8.1	8.4	8.6	8.9	9.4	9.8	10.0	10.6	11.0	11.4	12.1	12.4	12.5	12.5	12.3	12.3	12.3	12.4	12.5	12.4	12.0	12.1	11.8	11.3	10.7	10.4	9.9	9.2	8.7	8.3	8.0
12.1	11.8	11.7	11.8	12.2	12.4	12.6	12.9	13.0	13.0	13.4	13.9	14.1	14.4	14.7	15.1	15.7	16.2	16.4	16.7	16.5	16.5	16.9	17.3	16.8	16.7	17.4	16.5	15.6	15.9	15.6	15.5	14.8	14.1	13.3	12.6
15.4	15.4	15.3	15.4	15.4	15.6	16.0	16.5	16.2	16.5	16.5	16.9	17.1	17.1	17.0	17.1	17.4	17.7	18.0	18.3	18.7	19.2	19.6	19.8	20.0	19.7	19.5	19.1	18.5	18.3	18.1	17.7	17.1	16.6	16.1	15.6

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	.8	.8	.7	.7	.6	.6	.6	.7	.7	.7	.8	.8	.8	.8	.9	.9	.9	1.0	1.0	1.1
1.2	1.2	1.1	1.0	1.0	1.0	1.1	1.2	1.2	1.1	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	.9	.8	.7	.7	.7	.7	.8	.8	.8	.8	.8	.9	.8	.9	1.0	1.1	1.2
1.0	.8	.7	.7	.8	.8	.9	1.1	1.2	1.3	1.1	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.3	1.4	1.2	1.1	1.0	1.1	1.1	1.0	.9	.9	1.0	1.1	1.0	.9	.9	1.1	1.0	1.0
.9	.8	1.0	1.0	1.0	1.0	.9	.9	1.1	1.2	1.1	1.0	1.1	1.1	1.3	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.1	1.0	1.0	1.1	1.1	1.0
1.3	1.3	1.5	1.3	1.3	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.3	1.4	1.5	1.4	1.3	1.3	1.2	1.2	1.3	1.2	1.3	1.3	1.4	1.4	1.3	1.5	1.4	1.4	1.3	1.3	1.3	1.3	1.4
1.5	1.4	1.5	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.4	1.5	1.4	1.6	1.7	1.7	1.8	1.7	1.8	1.8	1.8	1.8	1.7	1.7	1.8	1.7	1.7	1.6	1.6
1.7	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.7	1.7	1.7	1.9	1.7	2.0	2.0	2.0	2.1	1.9	2.0	2.0	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.8	1.7
1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.9	1.8	2.0	1.9	1.9	2.0	1.9	2.0	1.9	2.0	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.8
1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
1.9	2.0	1.9	2.0	1.9	2.0	1.9	1.9	2.0	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.9	1.9	1.9	2.0	1.9
2.0	2.0	1.9	1.9	2.0	2.0	1.9	1.9	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.0	2.0	2.0	1.9	2.8	2.0
1.8	2.0	1.8	1.8	1.9	1.9	2.0	1.9	2.0	1.9	1.8	1.8	1.7	1.7	1.8	1.8	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.7	1.8	1.8	1.9	1.9	1.8	1.9	1.9	1.9	1.8	1.8	2.0	2.0
1.6	1.6	1.5	1.6	1.7	1.5	1.7	1.8	1.8	1.7	1.7	1.8	1.7	1.7	1.8	1.7	1.7	1.7	1.6	1.7	1.6	1.7	1.7	1.7	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.6	1.4	1.4	1.6	1.8
1.9	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.7	1.8	1.8	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.8	2.0	2.0	1.9	1.9	1.9	2.0	2.1	2.0	2.0	2.0	1.9	1.7	1.7	1.7	1.8
2.6	2.5	2.5	2.5	2.3	2.3	2.4	2.2	2.2	2.4	2.2	2.2	2.3	2.2	2.2	2.5	2.4	2.3	2.5	2.4	2.2	2.2	2.4	2.3	2.5	2.6	2.6	2.8	2.6	2.6	2.5	2.5	2.5	2.2	2.3	2.7
3.3	3.3	3.2	3.2	3.1	2.9	2.9	2.9	2.9	3.0	2.8	2.8	2.7	2.6	2.5	2.5	2.6	2.5	2.5	2.5	2.4	2.5	2.5	2.6	2.6	2.6	2.7	2.8	3.0	3.1	3.1	3.0	2.9	2.9	3.0	3.3
2.8	2.9	2.9	2.9	2.9	2.8	2.8	2.8	2.7	2.6	2.4	2.4	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.0	2.2	2.1	2.0	1.7	1.9	2.0	2.0	2.2	2.2	2.3	2.2	2.1	2.2	2.3	2.4	2.6
2.5	2.6	2.7	2.8	2.7	2.6	2.5	2.4	2.9	2.6	2.5	2.4	2.3	2.3	2.3	2.2	2.0	1.9	1.8	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.1	1.4	1.5	1.6	1.7	1.9	2.1	2.3	2.4

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

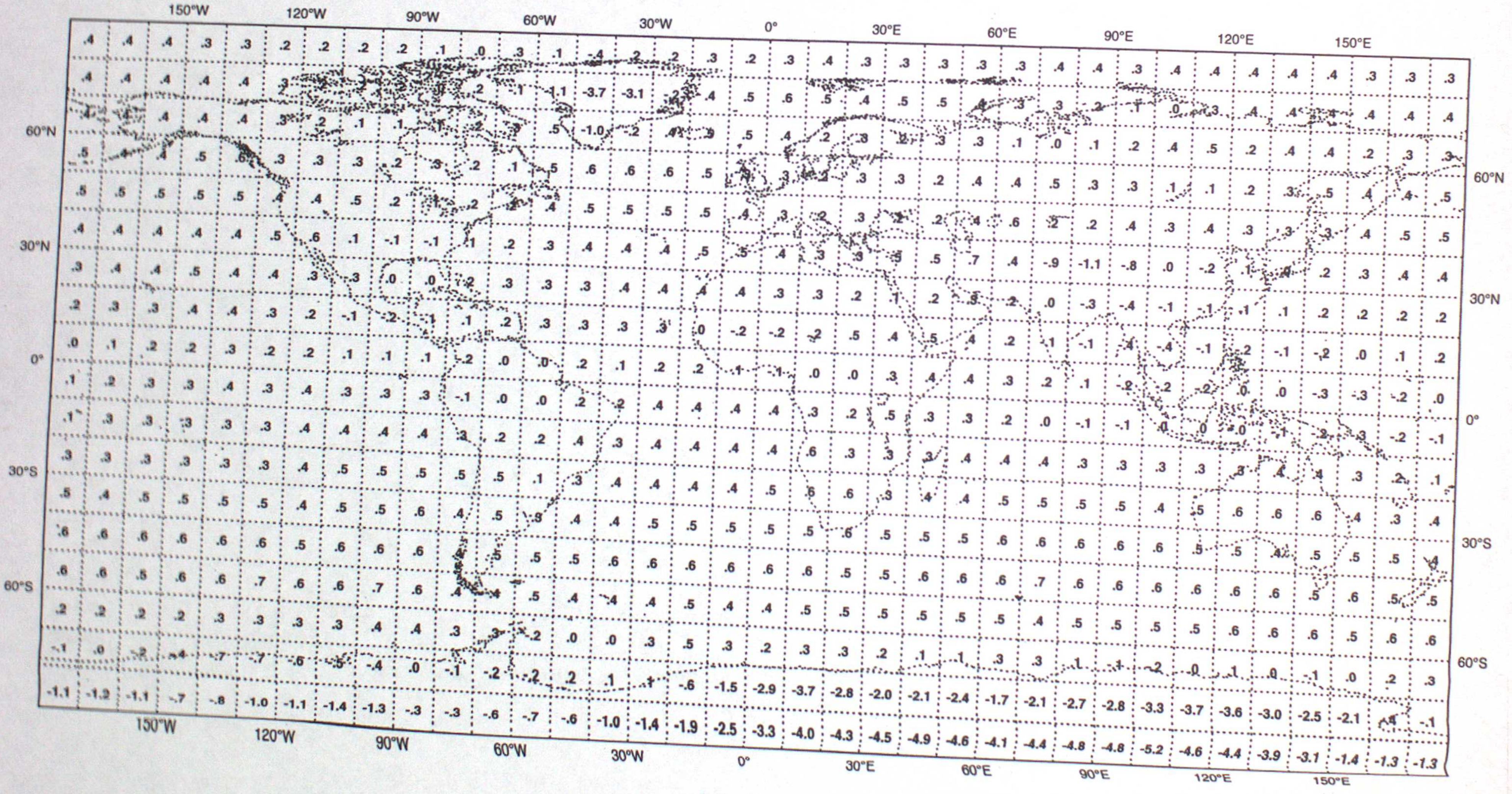
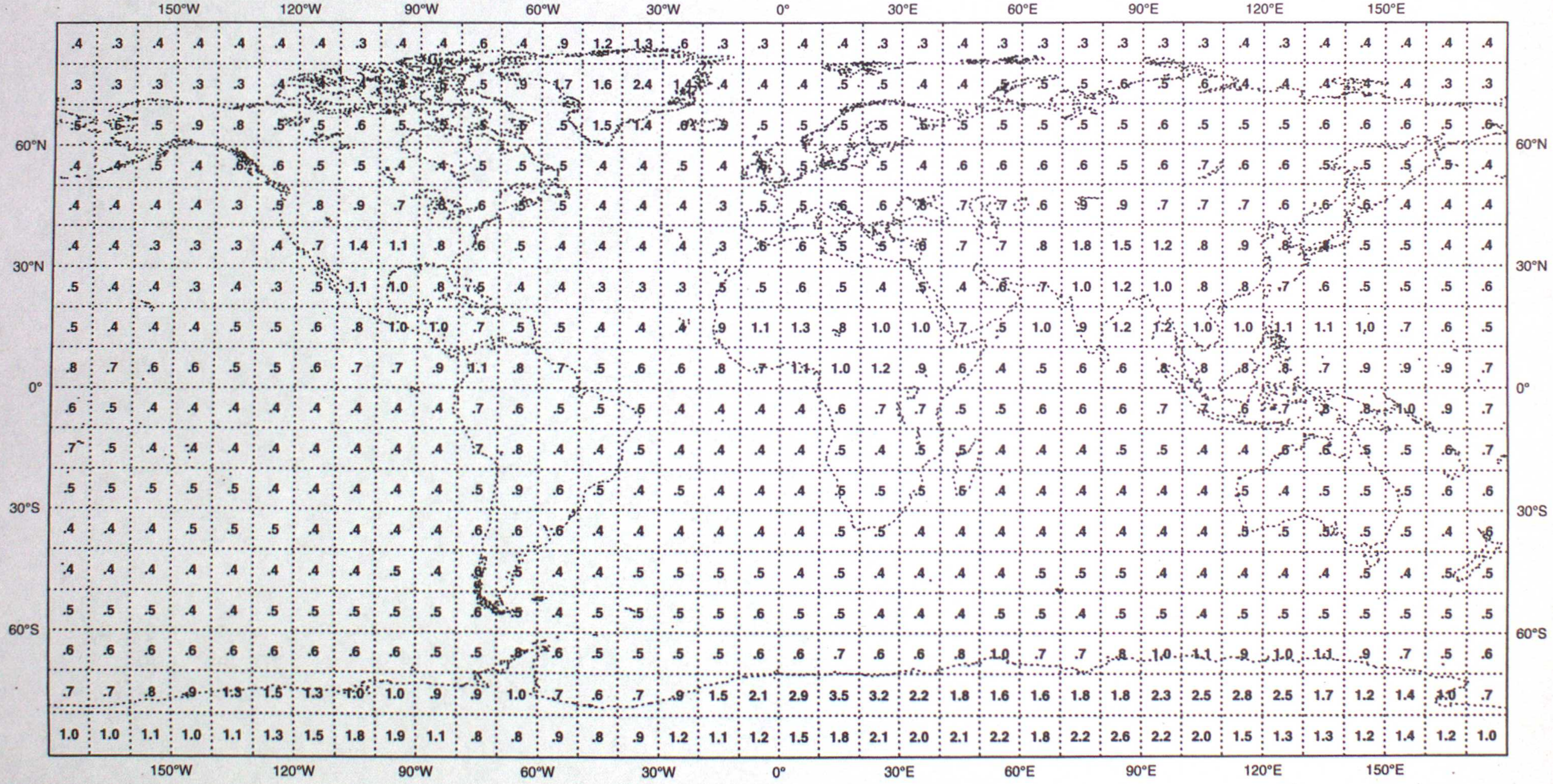

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.4	.3	.4	.4	.4	.4	.4	.3	.4	.4	.6	.4	.9	1.2	1.3	.6	.3	.3	.4	.4	.3	.3	.4	.3	.3	.3	.3	.3	.3	.4	.3	.4	.4	.4	.4	.4
.3	.3	.3	.3	.3	.4	.4	.4	.3	.5	.5	.9	1.7	1.6	2.4	1.4	.4	.4	.4	.5	.5	.4	.4	.5	.5	.5	.6	.5	.6	.4	.4	.4	.4	.4	.3	.3
.5	.6	.5	.9	.8	.5	.5	.6	.5	.5	.5	.5	.5	1.5	1.4	.6	.9	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.6	.6	.6	.5	.6
.4	.4	.5	.4	.6	.6	.5	.5	.4	.4	.5	.5	.5	.4	.4	.5	.4	.4	.5	.5	.5	.4	.6	.6	.6	.6	.5	.6	.7	.6	.6	.5	.5	.5	.5	.4
.4	.4	.4	.4	.3	.5	.8	.9	.7	.8	.6	.5	.5	.4	.4	.4	.3	.5	.5	.6	.6	.8	.7	.7	.6	.9	.9	.7	.7	.7	.6	.6	.6	.4	.4	.4
.4	.4	.3	.3	.3	.4	.7	1.4	1.1	.8	.6	.5	.4	.4	.4	.4	.3	.6	.6	.5	.5	.6	.7	.7	.8	1.8	1.5	1.2	.8	.9	.8	.4	.5	.5	.4	.4
.5	.4	.4	.3	.4	.3	.5	1.1	1.0	.8	.5	.4	.4	.3	.3	.3	.5	.5	.6	.5	.4	.5	.4	.6	.7	1.0	1.2	1.0	.8	.8	.7	.6	.5	.5	.5	.6
.5	.4	.4	.4	.5	.5	.6	.8	1.0	1.0	.7	.5	.5	.4	.4	.4	.9	1.1	1.3	.8	1.0	1.0	.7	.5	1.0	.9	1.2	1.2	1.0	1.0	1.1	1.1	1,0	.7	.6	.5
.8	.7	.6	.6	.5	.5	.6	.7	.7	.9	1.1	.8	.7	.5	.6	.6	.8	.7	1.1	1.0	1.2	.9	.6	.4	.5	.6	.6	.8	.8	.8	.8	.7	.9	.9	.9	.7
.6	.5	.4	.4	.4	.4	.4	.4	.4	.4	.7	.6	.5	.5	.5	.4	.4	.4	.4	.6	.7	.7	.5	.5	.6	.6	.6	.7	.7	.6	.7	.8	.8	1.0	.9	.7
.7	.5	.4	.4	.4	.4	.4	.4	.4	.4	.7	.8	.4	.4	.5	.4	.4	.4	.4	.5	.4	.5	.5	.4	.4	.4	.5	.5	.4	.4	.6	.6	.5	.5	.6	.7
.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5	.9	.6	.5	.4	.5	.4	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.4	.5	.5	.5	.6	.6
.4	.4	.4	.5	.5	.5	.4	.4	.4	.4	.6	.6	.6	.4	.4	.4	.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.4	.6
.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.6	.5	.4	.4	.5	.5	.5	.5	.4	.5	.4	.4	.4	.4	.5	.5	.5	.4	.4	.4	.4	.4	.5	.4	.5	.5
.5	.5	.5	.4	.4	.5	.5	.5	.5	.5	.6	.5	.4	.5	.5	.5	.5	.6	.5	.5	.4	.4	.4	.5	.5	.4	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5
.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.8	.6	.5	.5	.5	.5	.6	.6	.7	.6	.6	.8	1.0	.7	.7	.8	1.0	1.1	.9	1.0	1.1	.9	.7	.5	.6
.7	.7	.8	.9	1.3	1.5	1.3	1.0	1.0	.9	.9	1.0	.7	.6	.7	.9	1.5	2.1	2.9	3.5	3.2	2.2	1.8	1.6	1.6	1.8	1.8	2.3	2.5	2.8	2.5	1.7	1.2	1.4	1.0	.7
1.0	1.0	1.1	1.0	1.1	1.3	1.5	1.8	1.9	1.1	.8	.8	.9	.8	.9	1.2	1.1	1.2	1.5	1.8	2.1	2.0	2.1	2.2	1.8	2.2	2.6	2.2	2.0	1.5	1.3	1.3	1.2	1.4	1.2	1.0

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

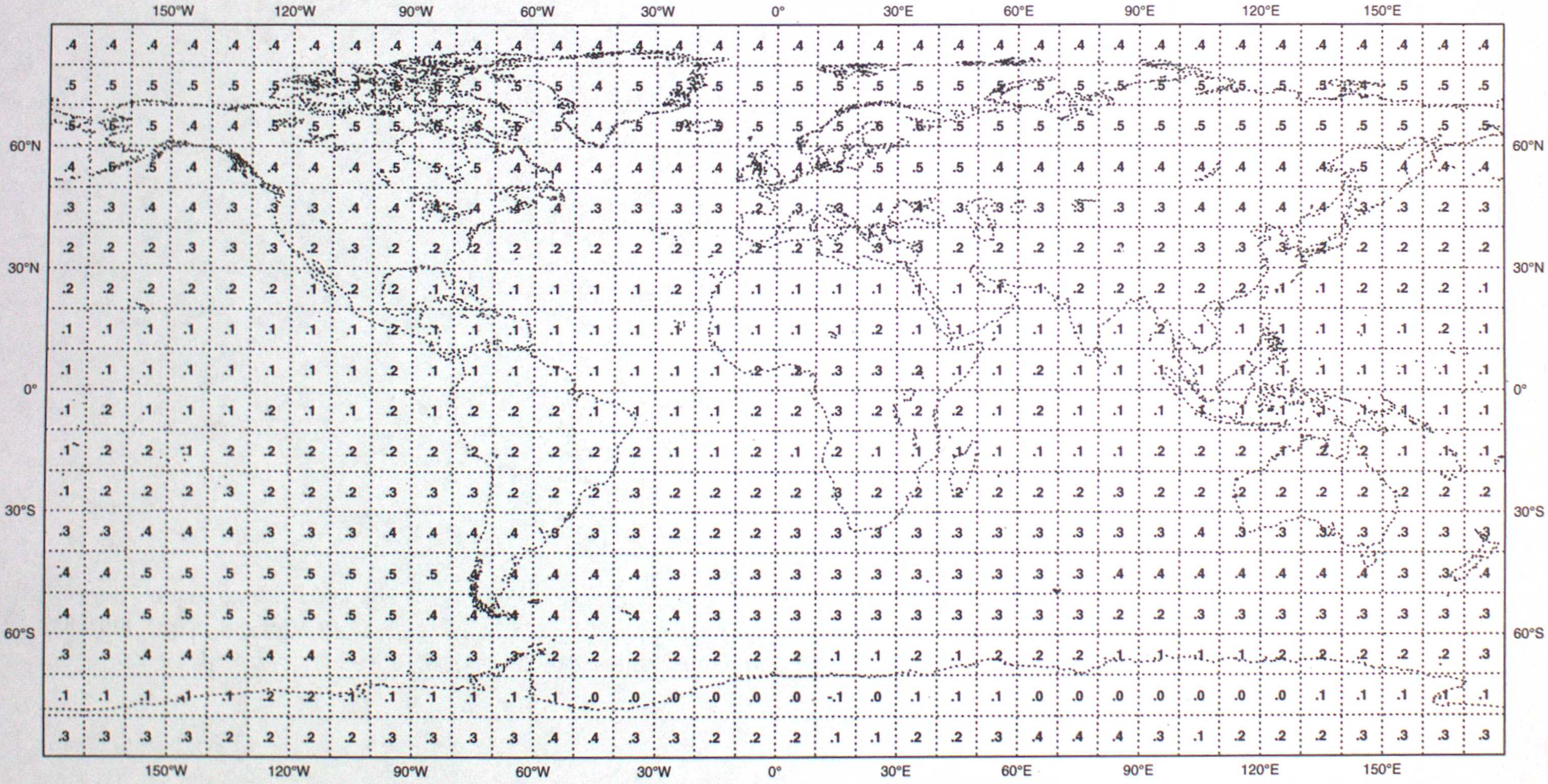

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5
.5 .6 .5 .4 .4 .5 .5 .5 .5 .6 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.4 .6 .5 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4
.3 .3 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .2 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .2 .3
.2 .2 .2 .3 .3 .3 .2 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .2 .2 .2 .2 .2 .2 .3 .3 .3 .2 .2 .2 .2 .2
.2 .2 .2 .2 .2 .2 .1 .2 .2 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .2 .2 .1 .1 .2 .2 .2 .1
.1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .2 .1
.1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .3 .3 .2 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1
.1 .2 .1 .1 .1 .2 .1 .1 .2 .1 .2 .2 .2 .1 .1 .1 .1 .2 .2 .3 .2 .2 .2 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1
.1 .2 .2 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .2 .1 .2 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .1 .2 .2 .1 .1 .1
.1 .2 .2 .2 .3 .2 .2 .2 .3 .3 .3 .2 .2 .2 .3 .2 .2 .2 .2 .3 .2 .2 .2 .2 .2 .2 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3
.4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4
.4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .1 .1 .2 .1 .2 .2 .2 .1 .1 .1 .1 .2 .2 .2 .2 .2 .3
.1 .1 .1 .1 .1 .2 .2 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .0 .0 -.1 .0 .1 .1 .1 .0 .0 .0 .0 .0 .0 .0 .1 .1 .1 .1 .1
.3 .3 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .4 .4 .3 .3 .2 .2 .2 .1 .1 .2 .2 .3 .4 .4 .4 .3 .1 .2 .2 .2 .3 .3 .3 .3

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

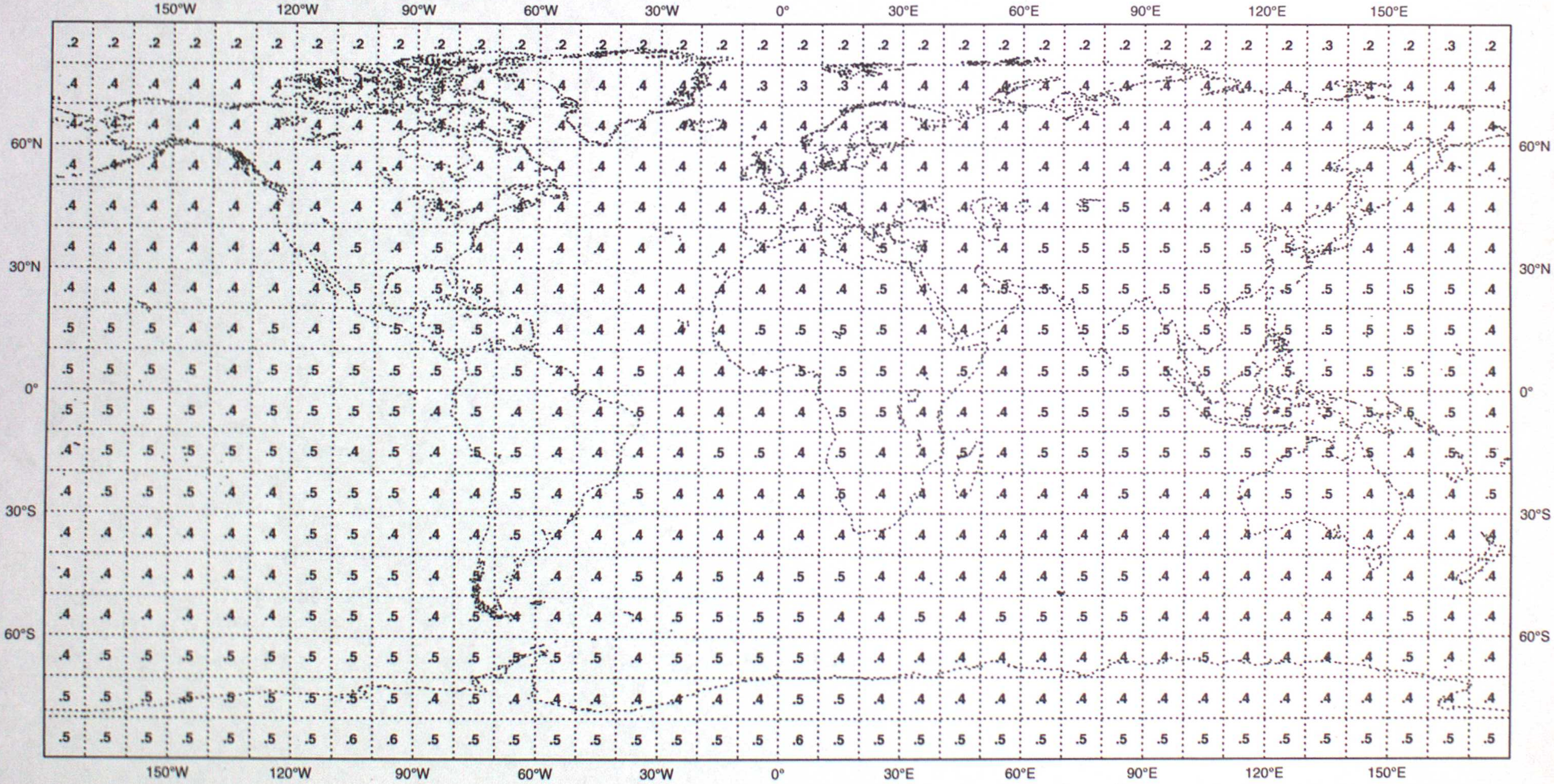

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .2 .2 .3 .2
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4
.5 .5 .5 .4 .4 .5 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4
.5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .4 .4 .4 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4
.5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .5 .4 .4 .4 .5 .4 .4 .4 .4 .5 .5 .4 .4 .4 .5 .5 .5 .5 .6 .5 .5 .5 .5 .6 .5 .4
.4 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .4 .4 .4 .4 .5 .5 .4 .5 .4 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.4 .5 .5 .5 .4 .4 .5 .5 .5 .4 .4 .5 .4 .4 .5 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .5 .5 .4 .4 .4 .5
.4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .5 .4 .4 .4 .5 .4 .5 .4 .5 .5 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .5 .4 .4 .4 .4 .5 .5 .5 .5 .4 .4 .5 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .4 .4
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .5 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

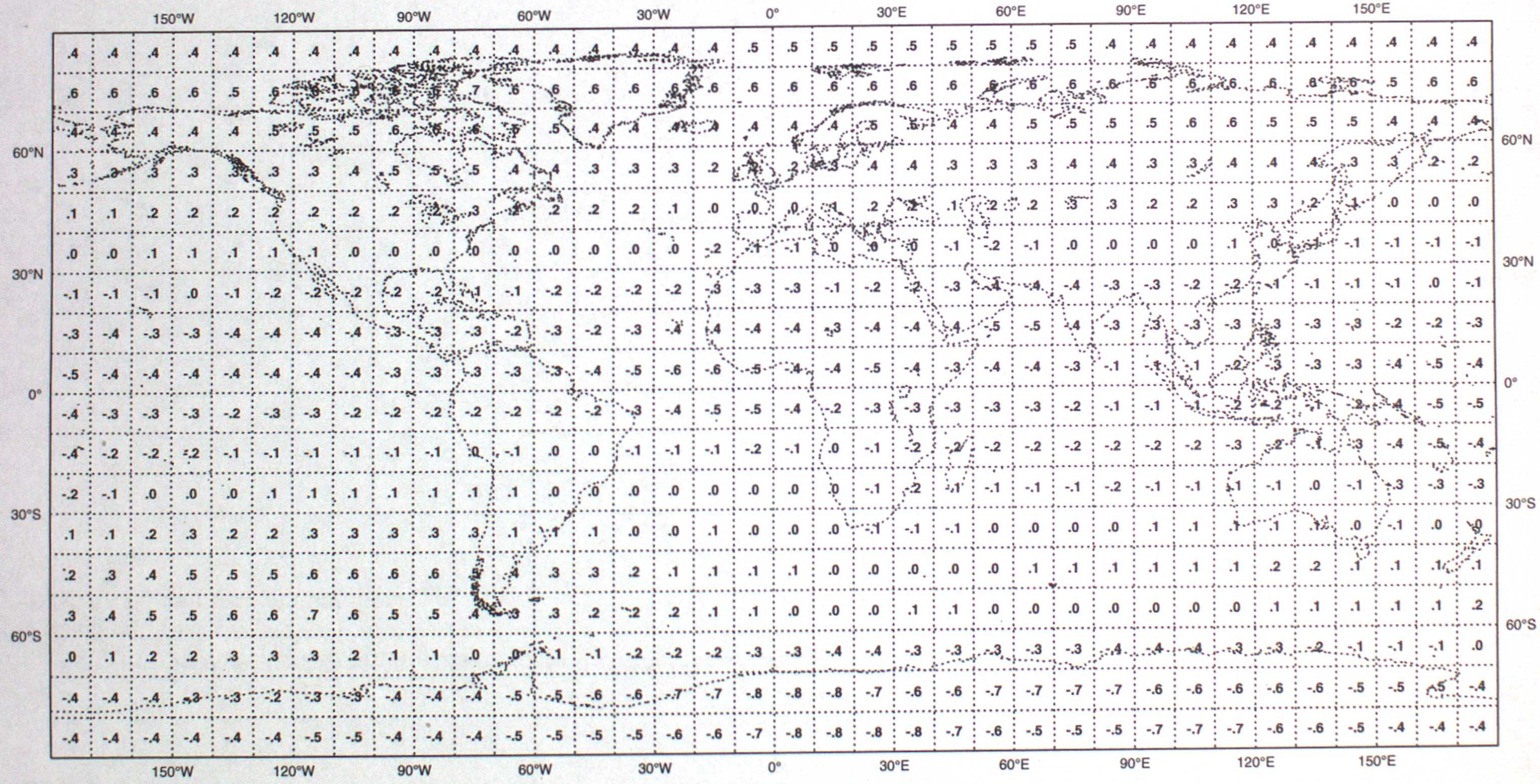

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

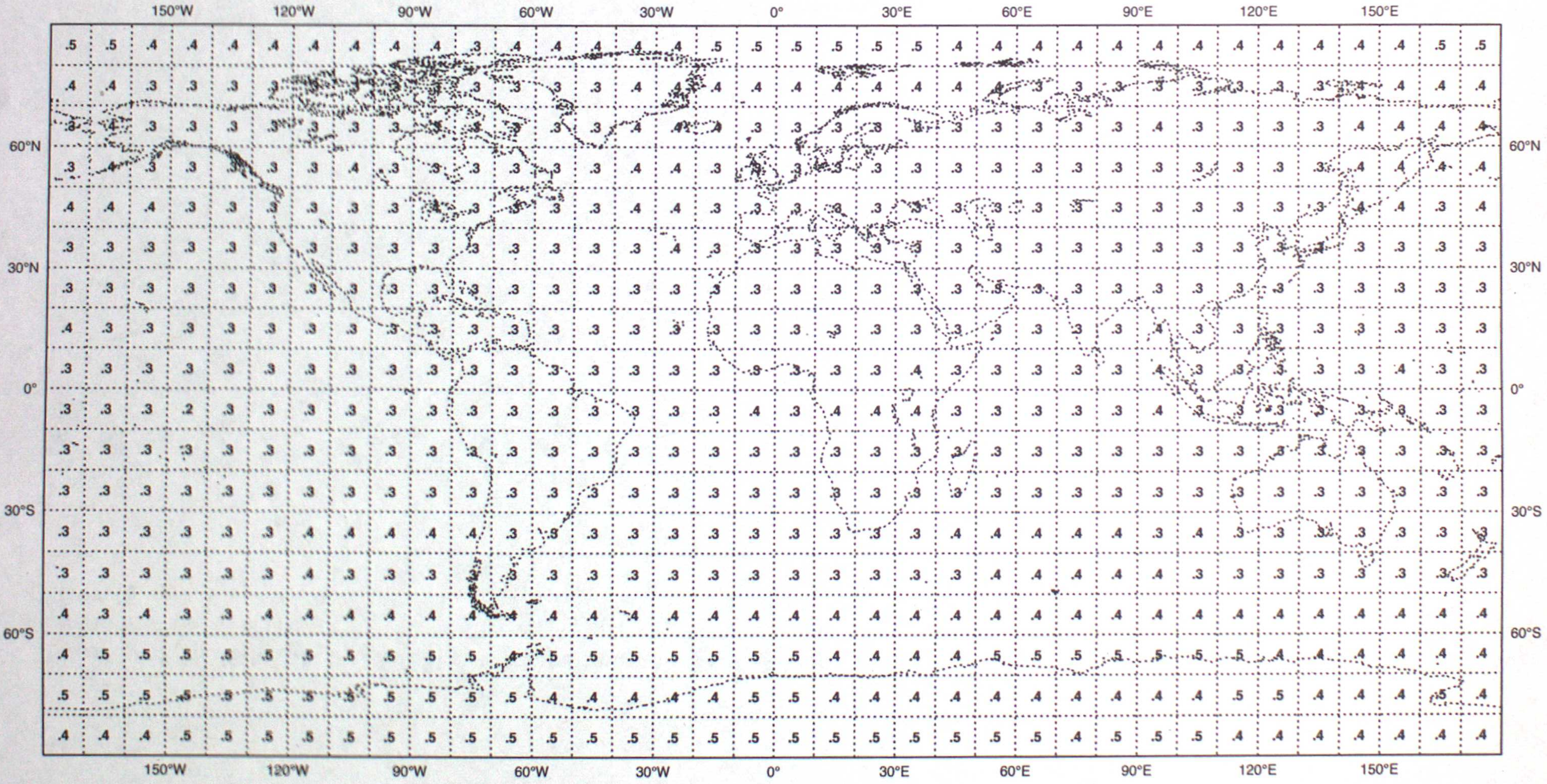
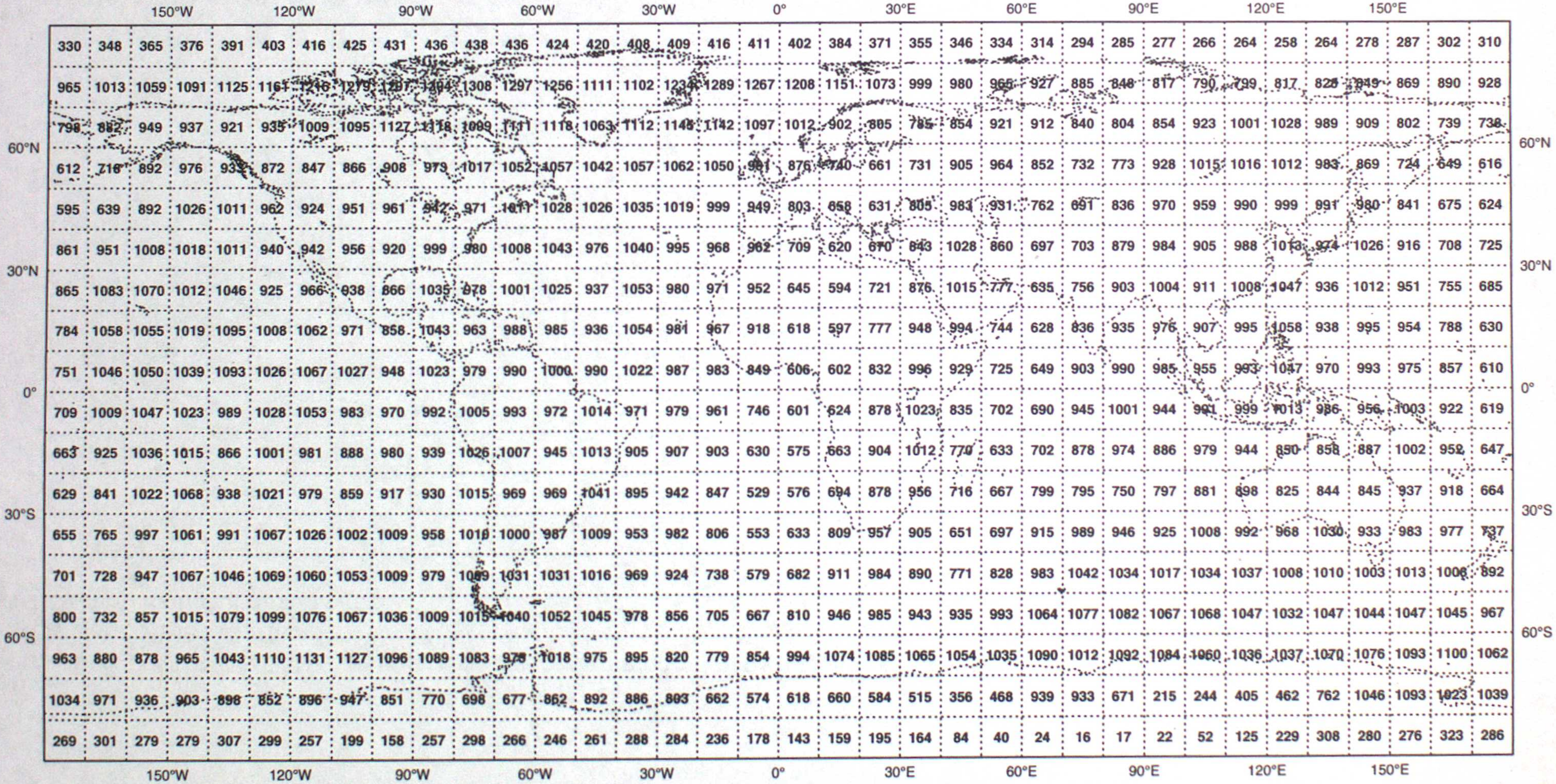
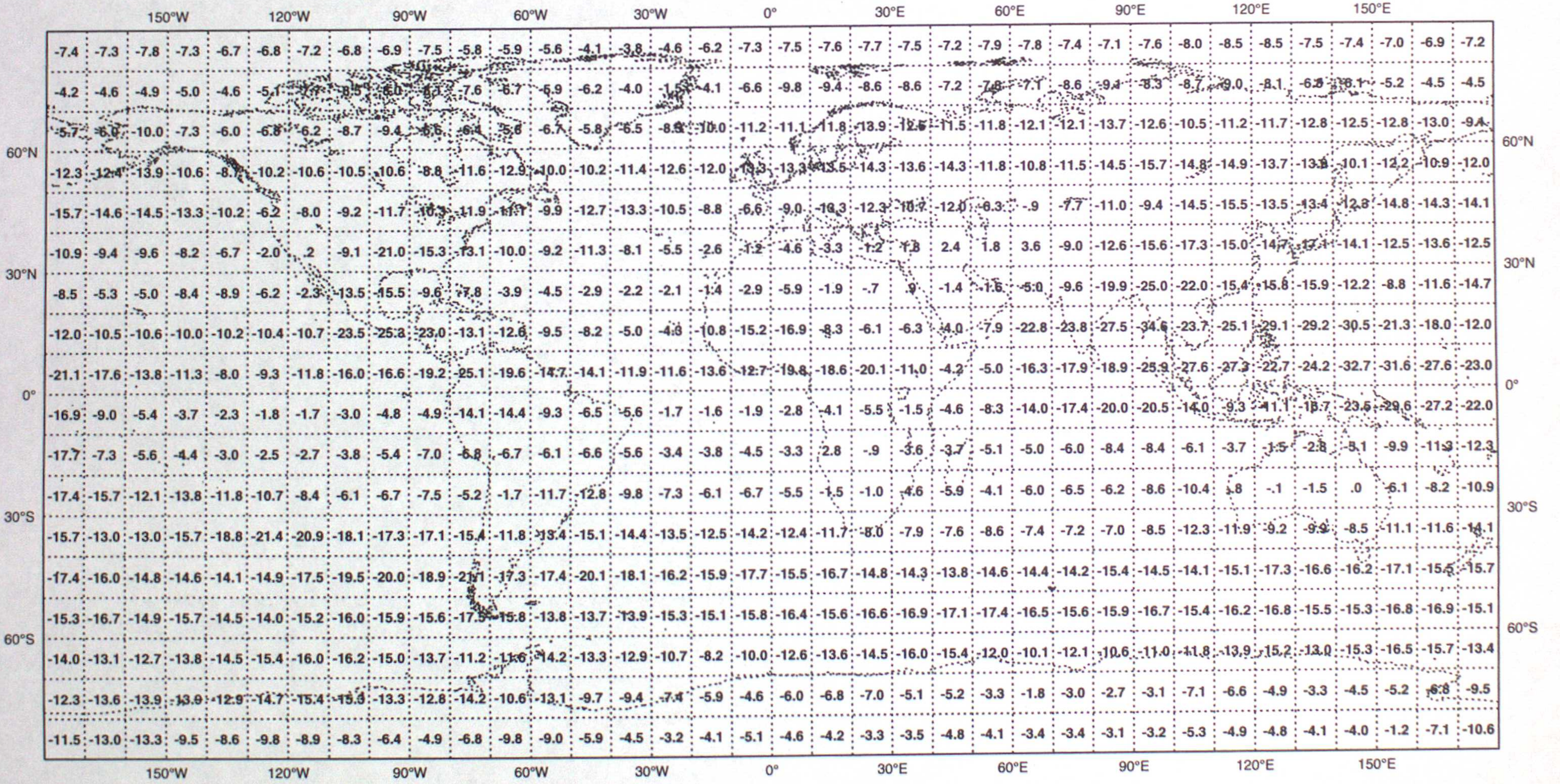

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5
.4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4
.3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .4 .4
.3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4
.4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3
.3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3
.4 .3 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .5 .4
.4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4

Figure 40. ATOVS mean daily count. JUNE 2004
NOAA16, using all observations
Global average number of observations in 24 hours = 551137



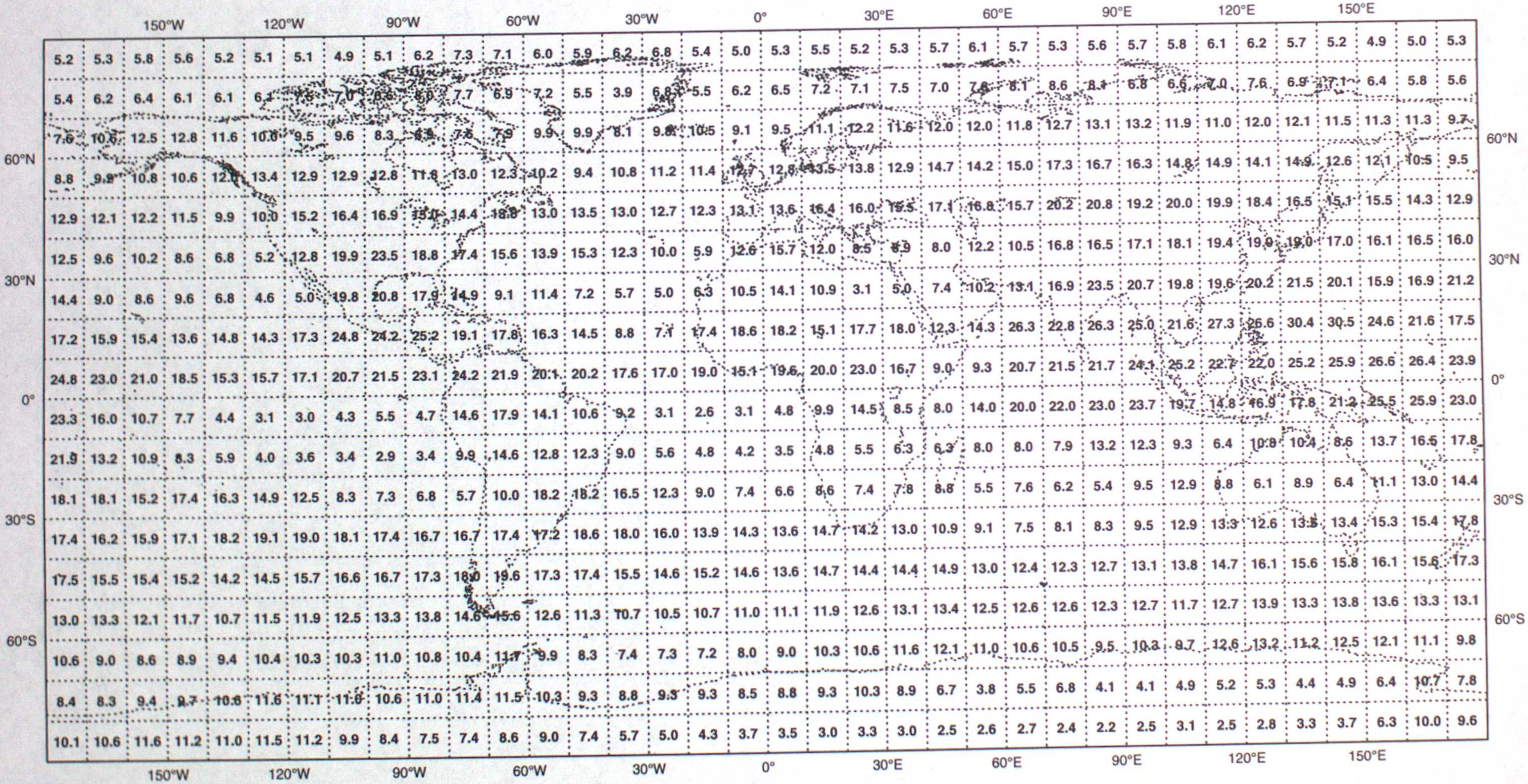
330	348	365	376	391	403	416	425	431	436	438	436	424	420	408	409	416	411	402	384	371	355	346	334	314	294	285	277	266	264	258	264	278	287	302	310
965	1013	1059	1091	1125	1161	1216	1279	1297	1304	1308	1297	1256	1111	1102	1234	1289	1267	1208	1151	1073	999	980	965	927	885	848	817	790	799	817	828	849	869	890	928
798	882	949	937	921	935	1009	1095	1127	1118	1099	1111	1118	1063	1112	1148	1142	1097	1012	902	805	785	854	921	912	840	804	854	923	1001	1028	989	909	802	739	738
612	716	892	976	932	872	847	866	908	979	1017	1052	1057	1042	1057	1062	1050	981	876	740	661	731	905	964	852	732	773	928	1015	1016	1012	983	869	724	649	616
595	639	892	1026	1011	962	924	951	961	942	971	1011	1028	1026	1035	1019	999	949	803	658	631	805	983	931	762	691	836	970	959	990	999	991	980	841	675	624
861	951	1008	1018	1011	940	942	956	920	999	980	1008	1043	976	1040	995	968	962	709	620	670	843	1028	860	697	703	879	984	905	988	1013	974	1026	916	708	725
865	1083	1070	1012	1046	925	966	938	866	1035	978	1001	1025	937	1053	980	971	952	645	594	721	876	1015	777	635	756	903	1004	911	1008	1047	936	1012	951	755	685
784	1058	1055	1019	1095	1008	1062	971	858	1043	963	988	985	936	1054	981	967	918	618	597	777	948	994	744	628	836	935	976	907	995	1058	938	995	954	788	630
751	1046	1050	1039	1093	1026	1067	1027	948	1023	979	990	1000	990	1022	987	983	849	606	602	832	996	929	725	649	903	990	985	955	993	1047	970	993	975	857	610
709	1009	1047	1023	989	1028	1053	983	970	992	1005	993	972	1014	971	979	961	746	601	624	878	1023	835	702	690	945	1001	944	991	999	1013	986	956	1003	922	619
663	925	1036	1015	866	1001	981	888	980	939	1026	1007	945	1013	905	907	903	630	575	663	904	1012	770	633	702	878	974	886	979	944	850	858	887	1002	952	647
629	841	1022	1068	938	1021	979	859	917	930	1015	969	969	1041	895	942	847	529	576	694	878	956	716	667	799	795	750	797	881	898	825	844	845	937	918	664
655	765	997	1061	991	1067	1026	1002	1009	958	1010	1000	987	1009	953	982	806	553	633	809	957	905	651	697	915	989	946	925	1008	992	968	1030	933	983	977	737
701	728	947	1067	1046	1069	1060	1053	1009	979	1089	1031	1031	1016	969	924	738	579	682	911	984	890	771	828	983	1042	1034	1017	1034	1037	1008	1010	1003	1013	1006	892
800	732	857	1015	1079	1099	1076	1067	1036	1009	1015	1040	1052	1045	978	856	705	667	810	946	985	943	935	993	1064	1077	1082	1067	1068	1047	1032	1047	1044	1047	1045	967
963	880	878	965	1043	1110	1131	1127	1096	1089	1083	978	1018	975	895	820	779	854	994	1074	1085	1065	1054	1035	1090	1012	1092	1084	1060	1036	1037	1070	1076	1093	1100	1062
1034	971	936	903	898	852	896	947	851	770	698	677	862	892	886	803	662	574	618	660	584	515	356	468	939	933	671	215	244	405	462	762	1046	1093	1023	1039
269	301	279	279	307	299	257	199	158	257	298	266	246	261	288	284	236	178	143	159	195	164	84	40	24	16	17	22	52	125	229	308	280	276	323	286

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



-7.4	-7.3	-7.8	-7.3	-6.7	-6.8	-7.2	-6.8	-6.9	-7.5	-5.8	-5.9	-5.6	-4.1	-3.8	-4.6	-6.2	-7.3	-7.5	-7.6	-7.7	-7.5	-7.2	-7.9	-7.8	-7.4	-7.1	-7.6	-8.0	-8.5	-8.5	-7.5	-7.4	-7.0	-6.9	-7.2
-4.2	-4.6	-4.9	-5.0	-4.6	-5.1	-7.7	-8.5	-6.0	-6.1	-7.6	-6.7	-5.9	-6.2	-4.0	-1.5	-4.1	-6.6	-9.8	-9.4	-8.6	-8.6	-7.2	-7.8	-7.1	-8.6	-9.4	-8.3	-8.7	-9.0	-8.1	-6.3	-6.1	-5.2	-4.5	-4.5
-5.7	-6.0	-10.0	-7.3	-6.0	-6.8	-6.2	-8.7	-9.4	-6.6	-6.4	-5.6	-6.7	-5.8	-6.5	-8.9	-10.0	-11.2	-11.1	-11.8	-13.9	-12.6	-11.5	-11.8	-12.1	-12.1	-13.7	-12.6	-10.5	-11.2	-11.7	-12.8	-12.5	-12.8	-13.0	-9.4
-12.3	-12.4	-13.9	-10.6	-8.7	-10.2	-10.6	-10.5	-10.6	-8.8	-11.6	-12.9	-10.0	-10.2	-11.4	-12.6	-12.0	-13.3	-13.3	-13.5	-14.3	-13.6	-14.3	-11.8	-10.8	-11.5	-14.5	-15.7	-14.8	-14.9	-13.7	-13.9	-10.1	-12.2	-10.9	-12.0
-15.7	-14.6	-14.5	-13.3	-10.2	-6.2	-8.0	-9.2	-11.7	-10.3	-11.9	-11.1	-9.9	-12.7	-13.3	-10.5	-8.8	-6.6	-9.0	-10.3	-12.3	-10.7	-12.0	-6.3	-.9	-7.7	-11.0	-9.4	-14.5	-15.5	-13.5	-13.4	-12.8	-14.8	-14.3	-14.1
-10.9	-9.4	-9.6	-8.2	-6.7	-2.0	.2	-9.1	-21.0	-15.3	-13.1	-10.0	-9.2	-11.3	-8.1	-5.5	-2.6	-1.2	-4.6	-3.3	-1.2	1.8	2.4	1.8	3.6	-9.0	-12.6	-15.6	-17.3	-15.0	-14.7	-17.1	-14.1	-12.5	-13.6	-12.5
-8.5	-5.3	-5.0	-8.4	-8.9	-6.2	-2.3	-13.5	-15.5	-9.6	-7.8	-3.9	-4.5	-2.9	-2.2	-2.1	-1.4	-2.9	-5.9	-1.9	-.7	.9	-1.4	-1.6	-5.0	-9.6	-19.9	-25.0	-22.0	-15.4	-15.8	-15.9	-12.2	-8.8	-11.6	-14.7
-12.0	-10.5	-10.6	-10.0	-10.2	-10.4	-10.7	-23.5	-25.3	-23.0	-13.1	-12.6	-9.5	-8.2	-5.0	-4.3	-10.8	-15.2	-16.9	-8.3	-6.1	-6.3	-4.0	-7.9	-22.8	-23.8	-27.5	-34.6	-23.7	-25.1	-29.1	-29.2	-30.5	-21.3	-18.0	-12.0
-21.1	-17.6	-13.8	-11.3	-8.0	-9.3	-11.8	-16.0	-16.6	-19.2	-25.1	-19.6	-14.7	-14.1	-11.9	-11.6	-13.6	-12.7	-19.8	-18.6	-20.1	-11.0	-4.2	-5.0	-16.3	-17.9	-18.9	-25.9	-27.6	-27.3	-22.7	-24.2	-32.7	-31.6	-27.6	-23.0
-16.9	-9.0	-5.4	-3.7	-2.3	-1.8	-1.7	-3.0	-4.8	-4.9	-14.1	-14.4	-9.3	-6.5	-5.6	-1.7	-1.6	-1.9	-2.8	-4.1	-5.5	-1.5	-4.6	-8.3	-14.0	-17.4	-20.0	-20.5	-14.0	-9.3	-11.1	-18.7	-23.5	-29.6	-27.2	-22.0
-17.7	-7.3	-5.6	-4.4	-3.0	-2.5	-2.7	-3.8	-5.4	-7.0	-6.8	-6.7	-6.1	-6.6	-5.6	-3.4	-3.8	-4.5	-3.3	2.8	-.9	-3.6	-3.7	-5.1	-5.0	-6.0	-8.4	-8.4	-6.1	-3.7	-1.5	-2.8	-5.1	-9.9	-11.3	-12.3
-17.4	-15.7	-12.1	-13.8	-11.8	-10.7	-8.4	-6.1	-6.7	-7.5	-5.2	-1.7	-11.7	-12.8	-9.8	-7.3	-6.1	-6.7	-5.5	-1.5	-1.0	-4.6	-5.9	-4.1	-6.0	-6.5	-6.2	-8.6	-10.4	.8	-.1	-1.5	.0	-6.1	-8.2	-10.9
-15.7	-13.0	-13.0	-15.7	-18.8	-21.4	-20.9	-18.1	-17.3	-17.1	-15.4	-11.8	-13.4	-15.1	-14.4	-13.5	-12.5	-14.2	-12.4	-11.7	-8.0	-7.9	-7.6	-8.6	-7.4	-7.2	-7.0	-8.5	-12.3	-11.9	-9.2	-9.9	-8.5	-11.1	-11.6	-14.1
-17.4	-16.0	-14.8	-14.6	-14.1	-14.9	-17.5	-19.5	-20.0	-18.9	-21.1	-17.3	-17.4	-20.1	-18.1	-16.2	-15.9	-17.7	-15.5	-16.7	-14.8	-14.3	-13.8	-14.6	-14.4	-14.2	-15.4	-14.5	-14.1	-15.1	-17.3	-16.6	-16.2	-17.1	-15.5	-15.7
-15.3	-16.7	-14.9	-15.7	-14.5	-14.0	-15.2	-16.0	-15.9	-15.6	-17.5	-15.8	-13.8	-13.7	-13.9	-15.3	-15.1	-15.8	-16.4	-15.6	-16.6	-16.9	-17.1	-17.4	-16.5	-15.6	-15.9	-16.7	-15.4	-16.2	-16.8	-15.5	-15.3	-16.8	-16.9	-15.1
-14.0	-13.1	-12.7	-13.8	-14.5	-15.4	-16.0	-16.2	-15.0	-13.7	-11.2	-11.6	-14.2	-13.3	-12.9	-10.7	-8.2	-10.0	-12.6	-13.6	-14.5	-16.0	-15.4	-12.0	-10.1	-12.1	-10.6	-11.0	-11.8	-13.9	-15.2	-13.0	-15.3	-16.5	-15.7	-13.4
-12.3	-13.6	-13.9	-13.9	-12.9	-14.7	-15.4	-15.3	-13.3	-12.8	-14.2	-10.6	-13.1	-9.7	-9.4	-7.4	-5.9	-4.6	-6.0	-6.8	-7.0	-5.1	-5.2	-3.3	-1.8	-3.0	-2.7	-3.1	-7.1	-6.6	-4.9	-3.3	-4.5	-5.2	-6.8	-9.5
-11.5	-13.0	-13.3	-9.5	-8.6	-9.8	-8.9	-8.3	-6.4	-4.9	-6.8	-9.8	-9.0	-5.9	-4.5	-3.2	-4.1	-5.1	-4.6	-4.2	-3.3	-3.5	-4.8	-4.1	-3.4	-3.4	-3.1	-3.2	-5.3	-4.9	-4.8	-4.1	-4.0	-1.2	-7.1	-10.6

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations



5.2	5.3	5.8	5.6	5.2	5.1	5.1	4.9	5.1	6.2	7.3	7.1	6.0	5.9	6.2	6.8	5.4	5.0	5.3	5.5	5.2	5.3	5.7	6.1	5.7	5.3	5.6	5.7	5.8	6.1	6.2	5.7	5.2	4.9	5.0	5.3
5.4	6.2	6.4	6.1	6.1	6.1	7.6	7.0	6.6	8.0	7.7	6.9	7.2	5.5	3.9	6.8	5.5	6.2	6.5	7.2	7.1	7.5	7.0	7.6	8.1	8.6	8.4	6.8	6.6	7.0	7.6	6.9	7.1	6.4	5.8	5.6
7.6	10.6	12.5	12.8	11.6	10.0	9.5	9.6	8.3	6.9	7.6	7.9	9.9	9.9	8.1	9.8	10.5	9.1	9.5	11.1	12.2	11.6	12.0	12.0	11.8	12.7	13.1	13.2	11.9	11.0	12.0	12.1	11.5	11.3	11.3	9.7
8.8	9.9	10.8	10.6	12.0	13.4	12.9	12.9	12.8	11.8	13.0	12.3	10.2	9.4	10.8	11.2	11.4	12.7	12.8	13.5	13.8	12.9	14.7	14.2	15.0	17.3	16.7	16.3	14.8	14.9	14.1	14.9	12.6	12.1	10.5	9.5
12.9	12.1	12.2	11.5	9.9	10.0	15.2	16.4	16.9	15.0	14.4	18.8	13.0	13.5	13.0	12.7	12.3	13.1	13.6	16.4	16.0	15.5	17.1	16.8	15.7	20.2	20.8	19.2	20.0	19.9	18.4	16.5	15.1	15.5	14.3	12.9
12.5	9.6	10.2	8.6	6.8	5.2	12.8	19.9	23.5	18.8	17.4	15.6	13.9	15.3	12.3	10.0	5.9	12.6	15.7	12.0	8.5	8.9	8.0	12.2	10.5	16.8	16.5	17.1	18.1	19.4	19.0	19.0	17.0	16.1	16.5	16.0
14.4	9.0	8.6	9.6	6.8	4.6	5.0	19.8	20.8	17.9	14.9	9.1	11.4	7.2	5.7	5.0	6.3	10.5	14.1	10.9	3.1	5.0	7.4	10.2	13.1	16.9	23.5	20.7	19.8	19.6	20.2	21.5	20.1	15.9	16.9	21.2
17.2	15.9	15.4	13.6	14.8	14.3	17.3	24.8	24.2	25.2	19.1	17.8	16.3	14.5	8.8	7.1	17.4	18.6	18.2	15.1	17.7	18.0	12.3	14.3	26.3	22.8	26.3	25.0	21.6	27.3	26.6	30.4	30.5	24.6	21.6	17.5
24.8	23.0	21.0	18.5	15.3	15.7	17.1	20.7	21.5	23.1	24.2	21.9	20.1	20.2	17.6	17.0	19.0	15.1	19.6	20.0	23.0	16.7	9.0	9.3	20.7	21.5	21.7	24.1	25.2	22.7	22.0	25.2	25.9	26.6	26.4	23.9
23.3	16.0	10.7	7.7	4.4	3.1	3.0	4.3	5.5	4.7	14.6	17.9	14.1	10.6	9.2	3.1	2.6	3.1	4.8	9.9	14.5	8.5	8.0	14.0	20.0	22.0	23.0	23.7	19.7	14.8	16.9	17.8	21.2	25.5	25.9	23.0
21.9	13.2	10.9	8.3	5.9	4.0	3.6	3.4	2.9	3.4	9.9	14.6	12.8	12.3	9.0	5.6	4.8	4.2	3.5	4.8	5.5	6.3	6.3	8.0	8.0	7.9	13.2	12.3	9.3	6.4	10.8	10.4	8.6	13.7	16.5	17.8
18.1	18.1	15.2	17.4	16.3	14.9	12.5	8.3	7.3	6.8	5.7	10.0	18.2	18.2	16.5	12.3	9.0	7.4	6.6	8.6	7.4	7.8	8.8	5.5	7.6	6.2	5.4	9.5	12.9	8.8	6.1	8.9	6.4	11.1	13.0	14.4
17.4	16.2	15.9	17.1	18.2	19.1	19.0	18.1	17.4	16.7	16.7	17.4	17.2	18.6	18.0	16.0	13.9	14.3	13.6	14.7	14.2	13.0	10.9	9.1	7.5	8.1	8.3	9.5	12.9	13.3	12.6	13.5	13.4	15.3	15.4	17.8
17.5	15.5	15.4	15.2	14.2	14.5	15.7	16.6	16.7	17.3	18.0	19.6	17.3	17.4	15.5	14.6	15.2	14.6	13.6	14.7	14.4	14.4	14.9	13.0	12.4	12.3	12.7	13.1	13.8	14.7	16.1	15.6	15.8	16.1	15.6	17.3
13.0	13.3	12.1	11.7	10.7	11.5	11.9	12.5	13.3	13.8	14.6	15.6	12.6	11.3	10.7	10.5	10.7	11.0	11.1	11.9	12.6	13.1	13.4	12.5	12.6	12.6	12.3	12.7	11.7	12.7	13.9	13.3	13.8	13.6	13.3	13.1
10.6	9.0	8.6	8.9	9.4	10.4	10.3	10.3	11.0	10.8	10.4	11.7	9.9	8.3	7.4	7.3	7.2	8.0	9.0	10.3	10.6	11.6	12.1	11.0	10.6	10.5	9.5	10.3	9.7	12.6	13.2	11.2	12.5	12.1	11.1	9.8
8.4	8.3	9.4	9.7	10.6	11.6	11.1	11.0	10.6	11.0	11.4	11.5	10.3	9.3	8.8	9.3	9.3	8.5	8.8	9.3	10.3	8.9	6.7	3.8	5.5	6.8	4.1	4.1	4.9	5.2	5.3	4.4	4.9	6.4	10.7	7.8
10.1	10.6	11.6	11.2	11.0	11.5	11.2	9.9	8.4	7.5	7.4	8.6	9.0	7.4	5.7	5.0	4.3	3.7	3.5	3.0	3.3	3.0	2.5	2.6	2.7	2.4	2.2	2.5	3.1	2.5	2.8	3.3	3.7	6.3	10.0	9.6

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

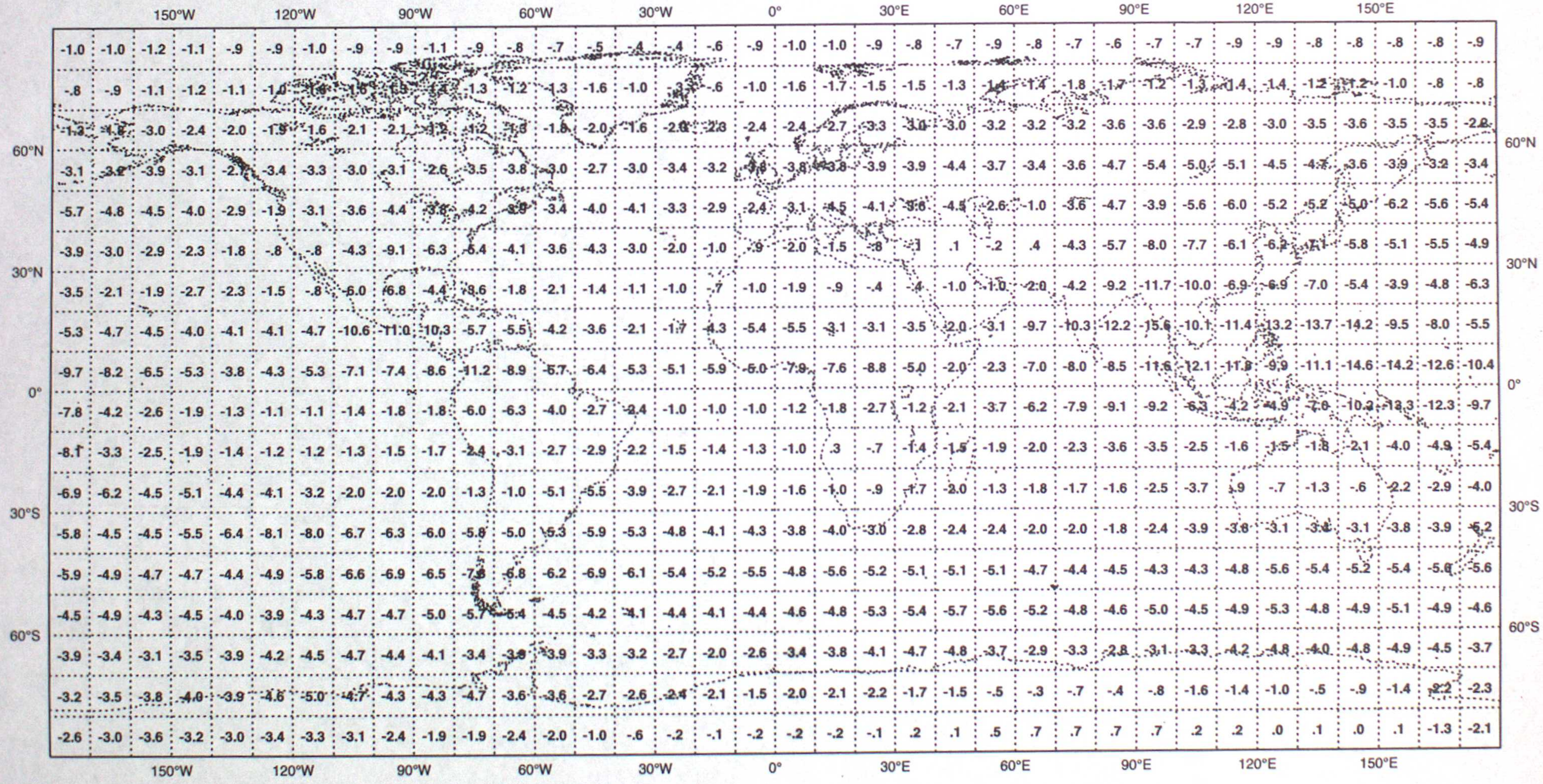
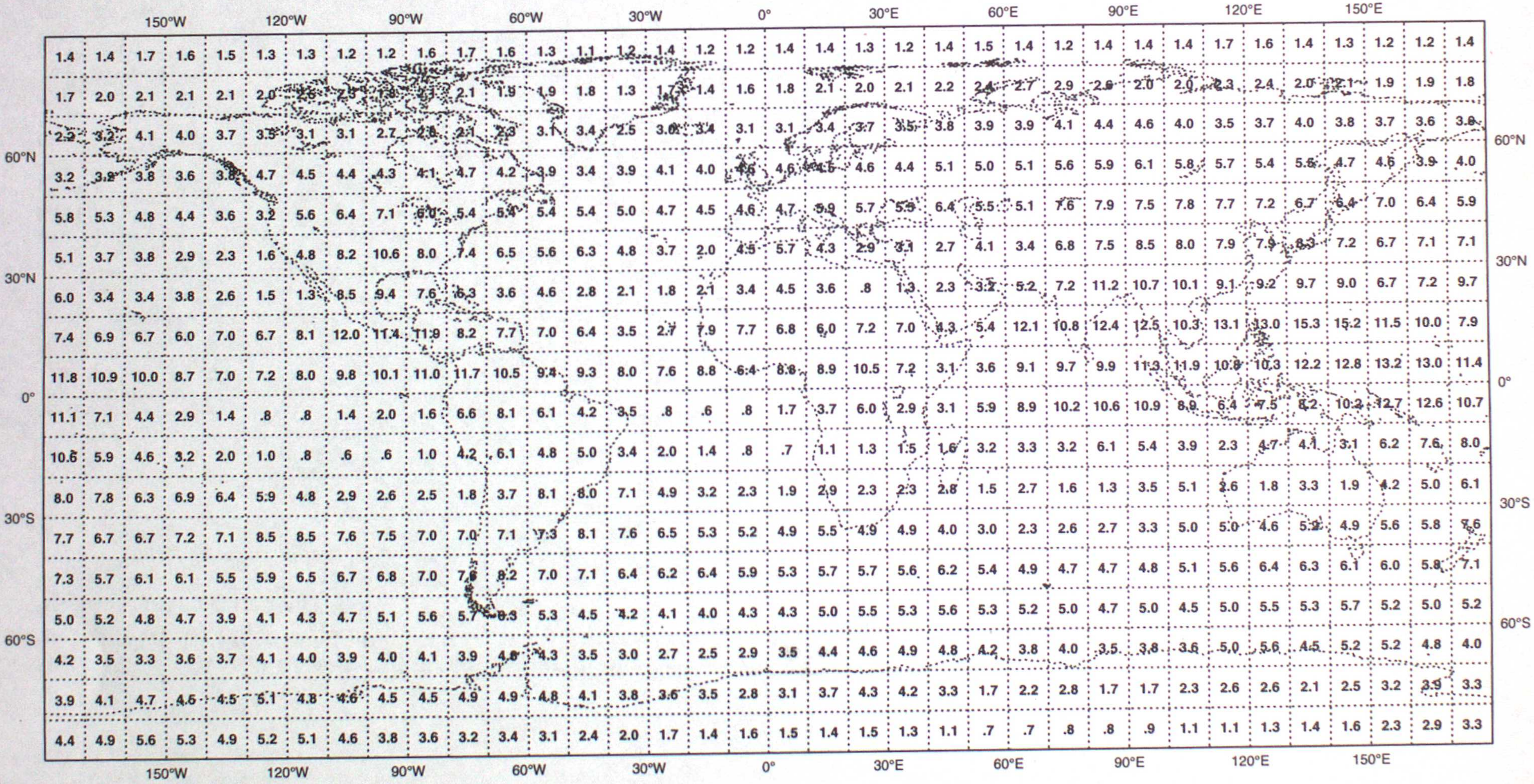

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.0 -1.0 -1.2 -1.1 -.9 -.9 -1.0 -.9 -.9 -1.1 -.9 -.8 -.7 -.5 -.4 -.4 -.6 -.9 -1.0 -1.0 -.9 -.8 -.7 -.9 -.8 -.7 -.6 -.7 -.7 -.9 -.9 -.8 -.8 -.8 -.8 -.9
-.8 -.9 -1.1 -1.2 -1.1 -1.0 -1.6 -1.6 -1.5 -1.4 -1.3 -1.2 -1.3 -1.6 -1.0 -.3 -.6 -1.0 -1.6 -1.7 -1.5 -1.5 -1.3 -1.4 -1.4 -1.8 -1.7 -1.2 -1.3 -1.4 -1.4 -1.2 -1.2 -1.0 -.8 -.8
-1.3 -1.8 -3.0 -2.4 -2.0 -1.9 -1.6 -2.1 -2.1 -1.2 -1.2 -1.8 -1.8 -2.0 -1.6 -2.0 -2.3 -2.4 -2.4 -2.7 -3.3 -3.0 -3.0 -3.2 -3.2 -3.2 -3.6 -3.6 -2.9 -2.8 -3.0 -3.5 -3.6 -3.5 -3.5 -2.8
-3.1 -3.2 -3.9 -3.1 -2.7 -3.4 -3.3 -3.0 -3.1 -2.6 -3.5 -3.8 -3.0 -2.7 -3.0 -3.4 -3.2 -3.6 -3.8 -3.8 -3.9 -3.9 -4.4 -3.7 -3.4 -3.6 -4.7 -5.4 -5.0 -5.1 -4.5 -4.7 -3.6 -3.9 -3.2 -3.4
-5.7 -4.8 -4.5 -4.0 -2.9 -1.9 -3.1 -3.6 -4.4 -3.8 -4.2 -3.9 -3.4 -4.0 -4.1 -3.3 -2.9 -2.4 -3.1 -4.5 -4.1 -3.6 -4.5 -2.6 -1.0 -3.6 -4.7 -3.9 -5.6 -6.0 -5.2 -5.2 -5.0 -6.2 -5.6 -5.4
-3.9 -3.0 -2.9 -2.3 -1.8 -.8 -.8 -4.3 -9.1 -6.3 -6.4 -4.1 -3.6 -4.3 -3.0 -2.0 -1.0 -.9 -2.0 -1.5 -.8 -.1 .1 -.2 .4 -4.3 -5.7 -8.0 -7.7 -6.1 -6.2 -7.1 -5.8 -5.1 -5.5 -4.9
-3.5 -2.1 -1.9 -2.7 -2.3 -1.5 -.8 -6.0 -6.8 -4.4 -8.6 -1.8 -2.1 -1.4 -1.1 -1.0 -.7 -1.0 -1.9 -.9 -.4 -.4 -1.0 -1.0 -2.0 -4.2 -9.2 -11.7 -10.0 -6.9 -6.9 -7.0 -5.4 -3.9 -4.8 -6.3
-5.3 -4.7 -4.5 -4.0 -4.1 -4.1 -4.7 -10.6 -11.0 -10.3 -5.7 -5.5 -4.2 -3.6 -2.1 -1.7 -4.3 -5.4 -5.5 -3.1 -3.1 -3.5 -2.0 -3.1 -9.7 -10.3 -12.2 -15.6 -10.1 -11.4 -13.2 -13.7 -14.2 -9.5 -8.0 -5.5
-9.7 -8.2 -6.5 -5.3 -3.8 -4.3 -5.3 -7.1 -7.4 -8.6 -11.2 -8.9 -5.7 -6.4 -5.3 -5.1 -5.9 -6.0 -7.9 -7.6 -8.8 -5.0 -2.0 -2.3 -7.0 -8.0 -8.5 -11.6 -12.1 -11.8 -9.9 -11.1 -14.6 -14.2 -12.6 -10.4
-7.8 -4.2 -2.6 -1.9 -1.3 -1.1 -1.1 -1.4 -1.8 -1.8 -6.0 -6.3 -4.0 -2.7 -2.4 -1.0 -1.0 -1.0 -1.2 -1.8 -2.7 -1.2 -2.1 -3.7 -6.2 -7.9 -9.1 -9.2 -6.3 -4.2 -4.9 -7.0 -10.2 -13.3 -12.3 -9.7
-8.1 -3.3 -2.5 -1.9 -1.4 -1.2 -1.2 -1.3 -1.5 -1.7 -2.4 -3.1 -2.7 -2.9 -2.2 -1.5 -1.4 -1.3 -1.0 .3 -.7 -1.4 -1.5 -1.9 -2.0 -2.3 -3.6 -3.5 -2.5 -1.6 -1.5 -1.8 -2.1 -4.0 -4.9 -5.4
-6.9 -6.2 -4.5 -5.1 -4.4 -4.1 -3.2 -2.0 -2.0 -2.0 -1.3 -1.0 -5.1 -5.5 -3.9 -2.7 -2.1 -1.9 -1.6 -1.0 -.9 -1.7 -2.0 -1.3 -1.8 -1.7 -1.6 -2.5 -3.7 .9 -.7 -1.3 -.6 -2.2 -2.9 -4.0
-5.8 -4.5 -4.5 -5.5 -6.4 -8.1 -8.0 -6.7 -6.3 -6.0 -5.8 -5.0 -5.3 -5.9 -5.3 -4.8 -4.1 -4.3 -3.8 -4.0 -3.0 -2.8 -2.4 -2.4 -2.0 -2.0 -1.8 -2.4 -3.9 -3.8 -3.1 -3.4 -3.1 -3.8 -3.9 -5.2
-5.9 -4.9 -4.7 -4.7 -4.4 -4.9 -5.8 -6.6 -6.9 -6.5 -7.8 -6.8 -6.2 -6.9 -6.1 -5.4 -5.2 -5.5 -4.8 -5.6 -5.2 -5.1 -5.1 -5.1 -4.7 -4.4 -4.5 -4.3 -4.3 -4.8 -5.6 -5.4 -5.2 -5.4 -5.6 -5.6
-4.5 -4.9 -4.3 -4.5 -4.0 -3.9 -4.3 -4.7 -4.7 -5.0 -5.7 -5.4 -4.5 -4.2 -4.1 -4.4 -4.1 -4.4 -4.6 -4.8 -5.3 -5.4 -5.7 -5.6 -5.2 -4.8 -4.6 -5.0 -4.5 -4.9 -5.3 -4.8 -4.9 -5.1 -4.9 -4.6
-3.9 -3.4 -3.1 -3.5 -3.9 -4.2 -4.5 -4.7 -4.4 -4.1 -3.4 -3.8 -3.9 -3.3 -3.2 -2.7 -2.0 -2.6 -3.4 -3.8 -4.1 -4.7 -4.8 -3.7 -2.9 -3.3 -2.8 -3.1 -3.3 -4.2 -4.8 -4.0 -4.8 -4.9 -4.5 -3.7
-3.2 -3.5 -3.8 -4.0 -3.9 -4.6 -5.0 -4.7 -4.3 -4.3 -4.7 -3.6 -3.6 -2.7 -2.6 -2.4 -2.1 -1.5 -2.0 -2.1 -2.2 -1.7 -1.5 -.5 -.3 -.7 -.4 -.8 -1.6 -1.4 -1.0 -.5 -.9 -1.4 -2.2 -2.3
-2.6 -3.0 -3.6 -3.2 -3.0 -3.4 -3.3 -3.1 -2.4 -1.9 -1.9 -2.4 -2.0 -1.0 -.6 -.2 -.1 -.2 -.2 -.2 -.1 .2 .1 .5 .7 .7 .7 .7 .2 .2 .0 .1 .0 .1 -1.3 -2.1

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



1.4	1.4	1.7	1.6	1.5	1.3	1.3	1.2	1.2	1.6	1.7	1.6	1.3	1.1	1.2	1.4	1.2	1.2	1.4	1.4	1.3	1.2	1.4	1.5	1.4	1.2	1.4	1.4	1.4	1.7	1.6	1.4	1.3	1.2	1.2	1.4
1.7	2.0	2.1	2.1	2.1	2.0	2.6	2.3	1.8	2.1	2.1	1.9	1.9	1.8	1.3	1.7	1.4	1.6	1.8	2.1	2.0	2.1	2.2	2.4	2.7	2.9	2.9	2.0	2.0	2.3	2.4	2.0	2.1	1.9	1.9	1.8
2.2	3.2	4.1	4.0	3.7	3.5	3.1	3.1	2.7	2.8	2.1	2.3	3.1	3.4	2.5	3.6	3.4	3.1	3.1	3.4	3.7	3.5	3.8	3.9	3.9	4.1	4.4	4.6	4.0	3.5	3.7	4.0	3.8	3.7	3.6	3.8
3.2	3.9	3.8	3.6	3.8	4.7	4.5	4.4	4.3	4.1	4.7	4.2	3.9	3.4	3.9	4.1	4.0	4.6	4.6	4.5	4.6	4.4	5.1	5.0	5.1	5.6	5.9	6.1	5.8	5.7	5.4	5.6	4.7	4.6	3.9	4.0
5.8	5.3	4.8	4.4	3.6	3.2	5.6	6.4	7.1	6.0	5.4	5.4	5.4	5.4	5.0	4.7	4.5	4.6	4.7	5.9	5.7	5.9	6.4	5.5	5.1	7.6	7.9	7.5	7.8	7.7	7.2	6.7	6.4	7.0	6.4	5.9
5.1	3.7	3.8	2.9	2.3	1.6	4.8	8.2	10.6	8.0	7.4	6.5	5.6	6.3	4.8	3.7	2.0	4.5	5.7	4.3	2.9	3.1	2.7	4.1	3.4	6.8	7.5	8.5	8.0	7.9	7.9	8.3	7.2	6.7	7.1	7.1
6.0	3.4	3.4	3.8	2.6	1.5	1.3	8.5	9.4	7.6	6.3	3.6	4.6	2.8	2.1	1.8	2.1	3.4	4.5	3.6	.8	1.3	2.3	3.2	5.2	7.2	11.2	10.7	10.1	9.1	9.2	9.7	9.0	6.7	7.2	9.7
7.4	6.9	6.7	6.0	7.0	6.7	8.1	12.0	11.4	11.9	8.2	7.7	7.0	6.4	3.5	2.7	7.9	7.7	6.8	6.0	7.2	7.0	4.3	5.4	12.1	10.8	12.4	12.5	10.3	13.1	13.0	15.3	15.2	11.5	10.0	7.9
11.8	10.9	10.0	8.7	7.0	7.2	8.0	9.8	10.1	11.0	11.7	10.5	9.4	9.3	8.0	7.6	8.8	6.4	8.8	8.9	10.5	7.2	3.1	3.6	9.1	9.7	9.9	11.3	11.9	10.8	10.3	12.2	12.8	13.2	13.0	11.4
11.1	7.1	4.4	2.9	1.4	.8	.8	1.4	2.0	1.6	6.6	8.1	6.1	4.2	3.5	.8	.6	.8	1.7	3.7	6.0	2.9	3.1	5.9	8.9	10.2	10.6	10.9	8.9	6.4	7.5	8.2	10.2	12.7	12.6	10.7
10.6	5.9	4.6	3.2	2.0	1.0	.8	.6	.6	1.0	4.2	6.1	4.8	5.0	3.4	2.0	1.4	.8	.7	1.1	1.3	1.5	1.6	3.2	3.3	3.2	6.1	5.4	3.9	2.3	4.7	4.1	3.1	6.2	7.6	8.0
8.0	7.8	6.3	6.9	6.4	5.9	4.8	2.9	2.6	2.5	1.8	3.7	8.1	8.0	7.1	4.9	3.2	2.3	1.9	2.9	2.3	2.3	2.8	1.5	2.7	1.6	1.3	3.5	5.1	2.6	1.8	3.3	1.9	4.2	5.0	6.1
7.7	6.7	6.7	7.2	7.1	8.5	8.5	7.6	7.5	7.0	7.0	7.1	7.3	8.1	7.6	6.5	5.3	5.2	4.9	5.5	4.9	4.9	4.0	3.0	2.3	2.6	2.7	3.3	5.0	5.0	4.6	5.2	4.9	5.6	5.8	7.6
7.3	5.7	6.1	6.1	5.5	5.9	6.5	6.7	6.8	7.0	7.6	8.2	7.0	7.1	6.4	6.2	6.4	5.9	5.3	5.7	5.7	5.6	6.2	5.4	4.9	4.7	4.7	4.8	5.1	5.6	6.4	6.3	6.1	6.0	5.8	7.1
5.0	5.2	4.8	4.7	3.9	4.1	4.3	4.7	5.1	5.6	5.7	6.3	5.3	4.5	4.2	4.1	4.0	4.3	4.3	5.0	5.5	5.3	5.6	5.3	5.2	5.0	4.7	5.0	4.5	5.0	5.5	5.3	5.7	5.2	5.0	5.2
4.2	3.5	3.3	3.6	3.7	4.1	4.0	3.9	4.0	4.1	3.9	4.6	4.3	3.5	3.0	2.7	2.5	2.9	3.5	4.4	4.6	4.9	4.8	4.2	3.8	4.0	3.5	3.8	3.6	5.0	5.6	4.5	5.2	5.2	4.8	4.0
3.9	4.1	4.7	4.6	4.5	5.1	4.8	4.6	4.5	4.5	4.9	4.9	4.8	4.1	3.8	3.6	3.5	2.8	3.1	3.7	4.3	4.2	3.3	1.7	2.2	2.8	1.7	1.7	2.3	2.6	2.6	2.1	2.5	3.2	3.9	3.3
4.4	4.9	5.6	5.3	4.9	5.2	5.1	4.6	3.8	3.6	3.2	3.4	3.1	2.4	2.0	1.7	1.4	1.6	1.5	1.4	1.5	1.3	1.1	.7	.7	.8	.8	.9	1.1	1.1	1.3	1.4	1.6	2.3	2.9	3.3

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

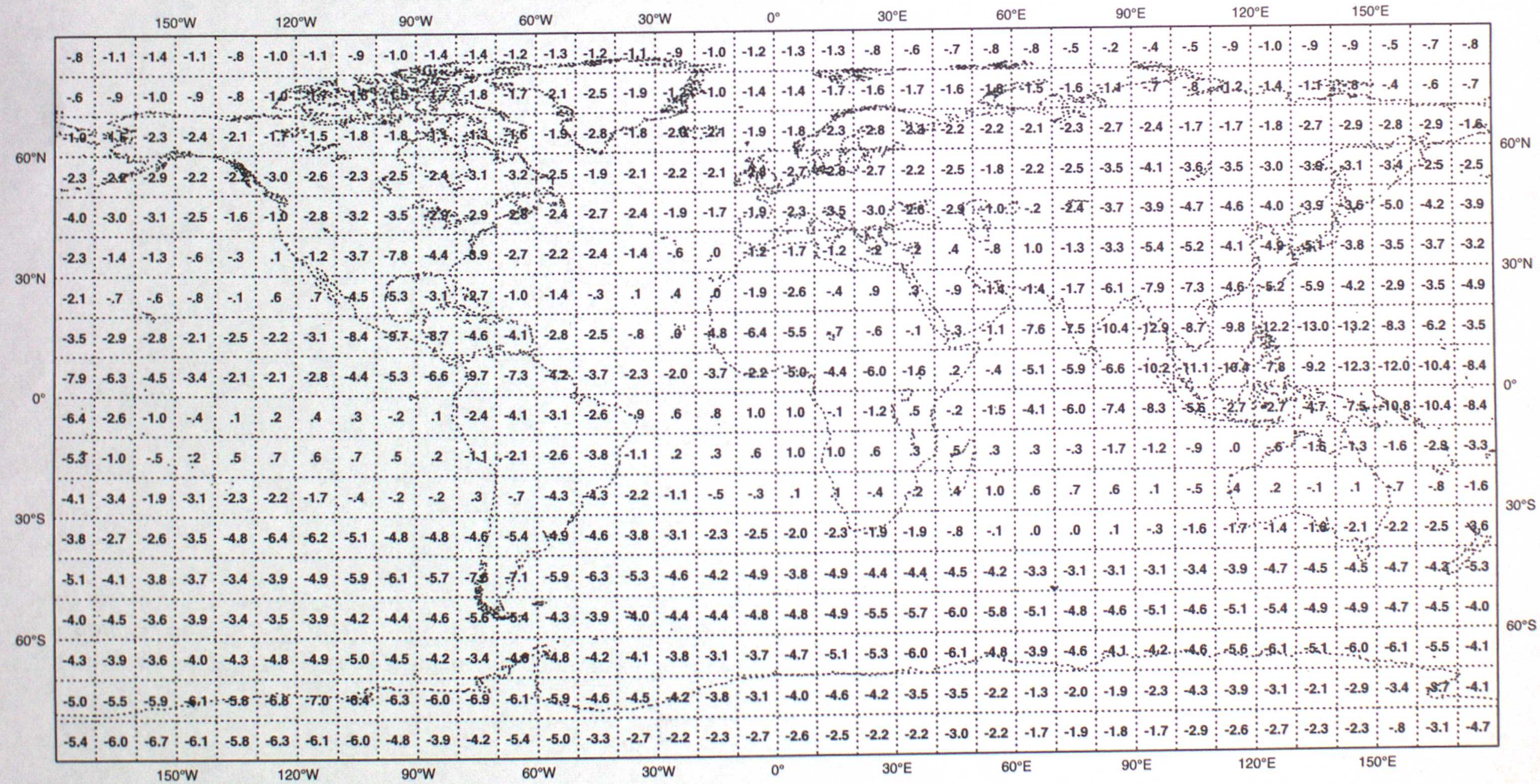
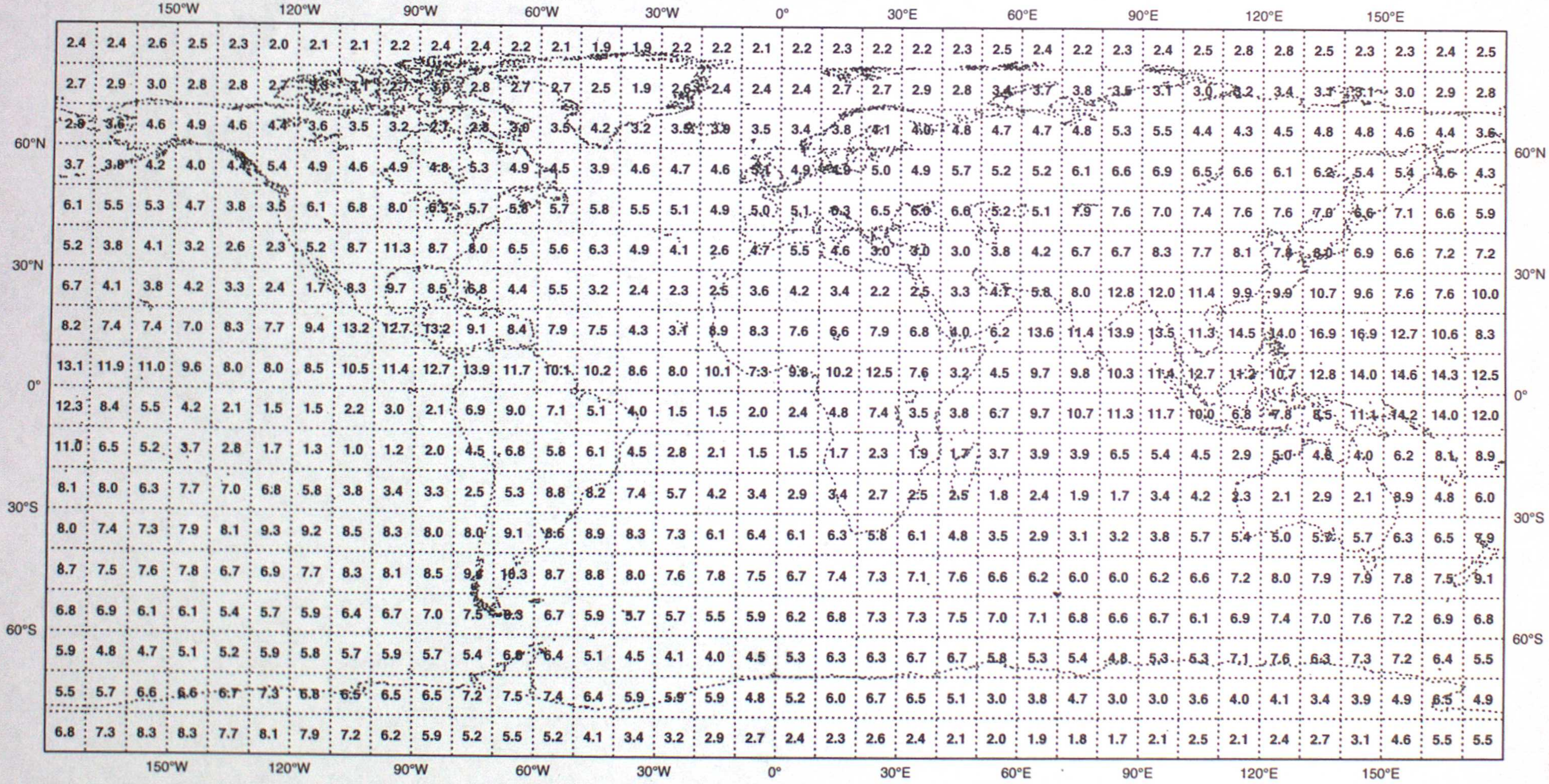

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.8 -1.1 -1.4 -1.1 -.8 -1.0 -1.1 -.9 -1.0 -1.4 -1.4 -1.2 -1.3 -1.2 -1.1 -.9 -1.0 -1.2 -1.3 -1.3 -.8 -.6 -.7 -.8 -.8 -.5 -.2 -.4 -.5 -.9 -1.0 -.9 -.9 -.5 -.7 -.8
-.6 -.9 -1.0 -.9 -.8 -1.0 -1.7 -1.6 -1.5 -1.7 -1.8 -1.7 -2.1 -2.5 -1.9 -1.2 -1.0 -1.4 -1.4 -1.7 -1.6 -1.7 -1.6 -1.8 -1.5 -1.6 -1.4 -.7 -.8 -1.2 -1.4 -1.1 -.8 -.4 -.6 -.7
-1.0 -1.6 -2.3 -2.4 -2.1 -1.7 -1.5 -1.8 -1.8 -1.3 -1.3 -1.6 -1.9 -2.8 -1.8 -2.0 -2.1 -1.9 -1.8 -2.3 -2.8 -2.3 -2.2 -2.2 -2.1 -2.3 -2.7 -2.4 -1.7 -1.7 -1.8 -2.7 -2.9 -2.8 -2.9 -1.6
-2.3 -2.9 -2.9 -2.2 -2.2 -3.0 -2.6 -2.3 -2.5 -2.4 -3.1 -3.2 -2.5 -1.9 -2.1 -2.2 -2.1 -2.8 -2.7 -2.8 -2.7 -2.2 -2.5 -1.8 -2.2 -2.5 -3.5 -4.1 -3.6 -3.5 -3.0 -3.9 -3.1 -3.4 -2.5 -2.5
-4.0 -3.0 -3.1 -2.5 -1.6 -1.0 -2.8 -3.2 -3.5 -2.9 -2.9 -2.8 -2.4 -2.7 -2.4 -1.9 -1.7 -1.9 -2.3 -3.5 -3.0 -2.6 -2.9 -1.0 -.2 -2.4 -3.7 -3.9 -4.7 -4.6 -4.0 -3.9 -3.6 -5.0 -4.2 -3.9
-2.3 -1.4 -1.3 -.6 -.3 .1 -1.2 -3.7 -7.8 -4.4 -3.9 -2.7 -2.2 -2.4 -1.4 -.6 .0 -1.2 -1.7 -1.2 -.2 -.2 .4 -.8 1.0 -1.3 -3.3 -5.4 -5.2 -4.1 -4.9 -5.1 -3.8 -3.5 -3.7 -3.2
-2.1 -.7 -.6 -.8 -.1 .6 .7 -4.5 -5.3 -3.1 -2.7 -1.0 -1.4 -.3 .1 .4 .0 -1.9 -2.6 -.4 .9 .3 -.9 -1.4 -1.4 -1.7 -6.1 -7.9 -7.3 -4.6 -5.2 -5.9 -4.2 -2.9 -3.5 -4.9
-3.5 -2.9 -2.8 -2.1 -2.5 -2.2 -3.1 -8.4 -9.7 -8.7 -4.6 -4.1 -2.8 -2.5 -.8 .0 -4.8 -6.4 -5.5 -.7 -.6 -.1 -.3 -1.1 -7.6 -7.5 -10.4 -12.9 -8.7 -9.8 -12.2 -13.0 -13.2 -8.3 -6.2 -3.5
-7.9 -6.3 -4.5 -3.4 -2.1 -2.1 -2.8 -4.4 -5.3 -6.6 -9.7 -7.3 -4.2 -3.7 -2.3 -2.0 -3.7 -2.2 -5.0 -4.4 -6.0 -1.6 .2 -.4 -5.1 -5.9 -6.6 -10.2 -11.1 -10.4 -7.8 -9.2 -12.3 -12.0 -10.4 -8.4
-6.4 -2.6 -1.0 -.4 .1 .2 .4 .3 -.2 .1 -2.4 -4.1 -3.1 -2.6 -.9 .6 .8 1.0 1.0 -.1 -1.2 .5 -.2 -1.5 -4.1 -6.0 -7.4 -8.3 -5.6 -2.7 -2.7 -4.7 -7.5 -10.8 -10.4 -8.4
-5.3 -1.0 -.5 -.2 .5 .7 .6 .7 .5 .2 -1.1 -2.1 -2.6 -3.8 -1.1 .2 .3 .6 1.0 1.0 .6 .3 .5 .3 .3 -.3 -1.7 -1.2 -.9 .0 -.6 -1.6 -1.3 -1.6 -2.8 -3.3
-4.1 -3.4 -1.9 -3.1 -2.3 -2.2 -1.7 -.4 -.2 -.2 .3 -.7 -4.3 -4.3 -2.2 -1.1 -.5 -.3 .1 .1 -.4 -.2 .4 1.0 .6 .7 .6 .1 -.5 .4 .2 -.1 .1 -.7 -.8 -1.6
-3.8 -2.7 -2.6 -3.5 -4.8 -6.4 -6.2 -5.1 -4.8 -4.8 -4.6 -5.4 -4.9 -4.6 -3.8 -3.1 -2.3 -2.5 -2.0 -2.3 -1.9 -1.9 -.8 -.1 .0 .0 .1 -.3 -1.6 -1.7 -1.4 -1.6 -2.1 -2.2 -2.5 -3.6
-5.1 -4.1 -3.8 -3.7 -3.4 -3.9 -4.9 -5.9 -6.1 -5.7 -7.6 -7.1 -5.9 -6.3 -5.3 -4.6 -4.2 -4.9 -3.8 -4.9 -4.4 -4.4 -4.5 -4.2 -3.3 -3.1 -3.1 -3.1 -3.4 -3.9 -4.7 -4.5 -4.5 -4.7 -4.3 -5.3
-4.0 -4.5 -3.6 -3.9 -3.4 -3.5 -3.9 -4.2 -4.4 -4.6 -5.6 -5.4 -4.3 -3.9 -4.0 -4.4 -4.4 -4.8 -4.8 -4.9 -5.5 -5.7 -6.0 -5.8 -5.1 -4.8 -4.6 -5.1 -4.6 -5.1 -5.4 -4.9 -4.9 -4.7 -4.5 -4.0
-4.3 -3.9 -3.6 -4.0 -4.3 -4.8 -4.9 -5.0 -4.5 -4.2 -3.4 -4.6 -4.8 -4.2 -4.1 -3.8 -3.1 -3.7 -4.7 -5.1 -5.3 -6.0 -6.1 -4.8 -3.9 -4.6 -4.1 -4.2 -4.6 -5.6 -6.1 -5.1 -6.0 -6.1 -5.5 -4.1
-5.0 -5.5 -5.9 -6.1 -5.8 -6.8 -7.0 -6.4 -6.3 -6.0 -6.9 -6.1 -5.9 -4.6 -4.5 -4.2 -3.8 -3.1 -4.0 -4.6 -4.2 -3.5 -3.5 -2.2 -1.3 -2.0 -1.9 -2.3 -4.3 -3.9 -3.1 -2.1 -2.9 -3.4 -3.7 -4.1
-5.4 -6.0 -6.7 -6.1 -5.8 -6.3 -6.1 -6.0 -4.8 -3.9 -4.2 -5.4 -5.0 -3.3 -2.7 -2.2 -2.3 -2.7 -2.6 -2.5 -2.2 -2.2 -3.0 -2.2 -1.7 -1.9 -1.8 -1.7 -2.9 -2.6 -2.7 -2.3 -2.3 -.8 -3.1 -4.7

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



2.4	2.4	2.6	2.5	2.3	2.0	2.1	2.1	2.2	2.4	2.4	2.2	2.1	1.9	1.9	2.2	2.2	2.1	2.2	2.3	2.2	2.2	2.3	2.5	2.4	2.2	2.3	2.4	2.5	2.8	2.8	2.5	2.3	2.3	2.4	2.5
2.7	2.9	3.0	2.8	2.8	2.7	3.6	3.1	2.7	3.0	2.8	2.7	2.7	2.5	1.9	2.6	2.4	2.4	2.4	2.7	2.7	2.9	2.8	3.4	3.7	3.8	3.5	3.1	3.0	3.2	3.4	3.1	3.1	3.0	2.9	2.8
2.8	3.6	4.6	4.9	4.6	4.4	3.6	3.5	3.2	2.7	2.8	3.0	3.5	4.2	3.2	3.5	3.9	3.5	3.4	3.8	4.1	4.0	4.8	4.7	4.7	4.8	5.3	5.5	4.4	4.3	4.5	4.8	4.8	4.6	4.4	3.6
3.7	3.8	4.2	4.0	4.4	5.4	4.9	4.6	4.9	4.8	5.3	4.9	4.5	3.9	4.6	4.7	4.6	5.1	4.9	4.9	5.0	4.9	5.7	5.2	5.2	6.1	6.6	6.9	6.5	6.6	6.1	6.2	5.4	5.4	4.6	4.3
6.1	5.5	5.3	4.7	3.8	3.5	6.1	6.8	8.0	6.5	5.7	5.8	5.7	5.8	5.5	5.1	4.9	5.0	5.1	6.3	6.5	6.0	6.6	5.2	5.1	7.9	7.6	7.0	7.4	7.6	7.6	7.0	6.6	7.1	6.6	5.9
5.2	3.8	4.1	3.2	2.6	2.3	5.2	8.7	11.3	8.7	8.0	6.5	5.6	6.3	4.9	4.1	2.6	4.7	5.5	4.6	3.0	3.0	3.0	3.8	4.2	6.7	6.7	8.3	7.7	8.1	7.8	8.0	6.9	6.6	7.2	7.2
6.7	4.1	3.8	4.2	3.3	2.4	1.7	8.3	9.7	8.5	6.8	4.4	5.5	3.2	2.4	2.3	2.5	3.6	4.2	3.4	2.2	2.5	3.3	4.1	5.8	8.0	12.8	12.0	11.4	9.9	9.9	10.7	9.6	7.6	7.6	10.0
8.2	7.4	7.4	7.0	8.3	7.7	9.4	13.2	12.7	13.2	9.1	8.4	7.9	7.5	4.3	3.1	8.9	8.3	7.6	6.6	7.9	6.8	4.0	6.2	13.6	11.4	13.9	13.5	11.3	14.5	14.0	16.9	16.9	12.7	10.6	8.3
13.1	11.9	11.0	9.6	8.0	8.0	8.5	10.5	11.4	12.7	13.9	11.7	10.1	10.2	8.6	8.0	10.1	7.3	9.8	10.2	12.5	7.6	3.2	4.5	9.7	9.8	10.3	11.4	12.7	11.2	10.7	12.8	14.0	14.6	14.3	12.5
12.3	8.4	5.5	4.2	2.1	1.5	1.5	2.2	3.0	2.1	6.9	9.0	7.1	5.1	4.0	1.5	1.5	2.0	2.4	4.8	7.4	3.5	3.8	6.7	9.7	10.7	11.3	11.7	10.0	6.8	7.8	8.5	11.1	14.2	14.0	12.0
11.0	6.5	5.2	3.7	2.8	1.7	1.3	1.0	1.2	2.0	4.5	6.8	5.8	6.1	4.5	2.8	2.1	1.5	1.5	1.7	2.3	1.9	1.7	3.7	3.9	3.9	6.5	5.4	4.5	2.9	5.0	4.8	4.0	6.2	8.1	8.9
8.1	8.0	6.3	7.7	7.0	6.8	5.8	3.8	3.4	3.3	2.5	5.3	8.8	8.2	7.4	5.7	4.2	3.4	2.9	3.4	2.7	2.5	2.5	1.8	2.4	1.9	1.7	3.4	4.2	2.3	2.1	2.9	2.1	8.9	4.8	6.0
8.0	7.4	7.3	7.9	8.1	9.3	9.2	8.5	8.3	8.0	8.0	9.1	8.6	8.9	8.3	7.3	6.1	6.4	6.1	6.3	5.8	6.1	4.8	3.5	2.9	3.1	3.2	3.8	5.7	5.4	5.0	5.7	5.7	6.3	6.5	7.9
8.7	7.5	7.6	7.8	6.7	6.9	7.7	8.3	8.1	8.5	9.4	10.3	8.7	8.8	8.0	7.6	7.8	7.5	6.7	7.4	7.3	7.1	7.6	6.6	6.2	6.0	6.0	6.2	6.6	7.2	8.0	7.9	7.9	7.8	7.5	9.1
6.8	6.9	6.1	6.1	5.4	5.7	5.9	6.4	6.7	7.0	7.5	8.3	6.7	5.9	5.7	5.7	5.5	5.9	6.2	6.8	7.3	7.3	7.5	7.0	7.1	6.8	6.6	6.7	6.1	6.9	7.4	7.0	7.6	7.2	6.9	6.8
5.9	4.8	4.7	5.1	5.2	5.9	5.8	5.7	5.9	5.7	5.4	6.8	6.4	5.1	4.5	4.1	4.0	4.5	5.3	6.3	6.3	6.7	6.7	5.8	5.3	5.4	4.8	5.3	5.3	7.1	7.6	6.3	7.3	7.2	6.4	5.5
5.5	5.7	6.6	6.6	6.7	7.3	6.8	6.5	6.5	6.5	7.2	7.5	7.4	6.4	5.9	5.9	5.9	4.8	5.2	6.0	6.7	6.5	5.1	3.0	3.8	4.7	3.0	3.0	3.6	4.0	4.1	3.4	3.9	4.9	6.5	4.9
6.8	7.3	8.3	8.3	7.7	8.1	7.9	7.2	6.2	5.9	5.2	5.5	5.2	4.1	3.4	3.2	2.9	2.7	2.4	2.3	2.6	2.4	2.1	2.0	1.9	1.8	1.7	2.1	2.5	2.1	2.4	2.7	3.1	4.6	5.5	5.5

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

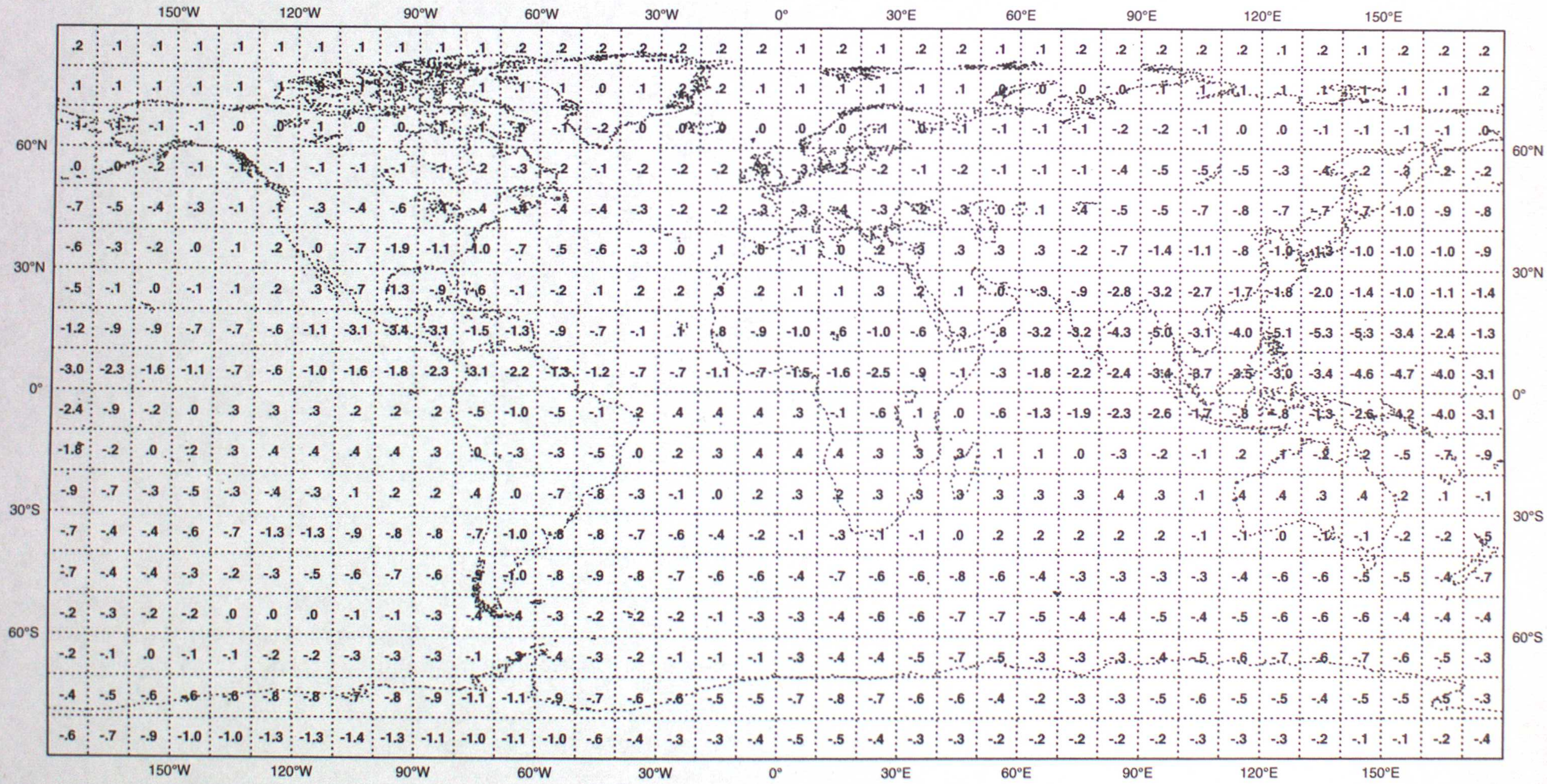
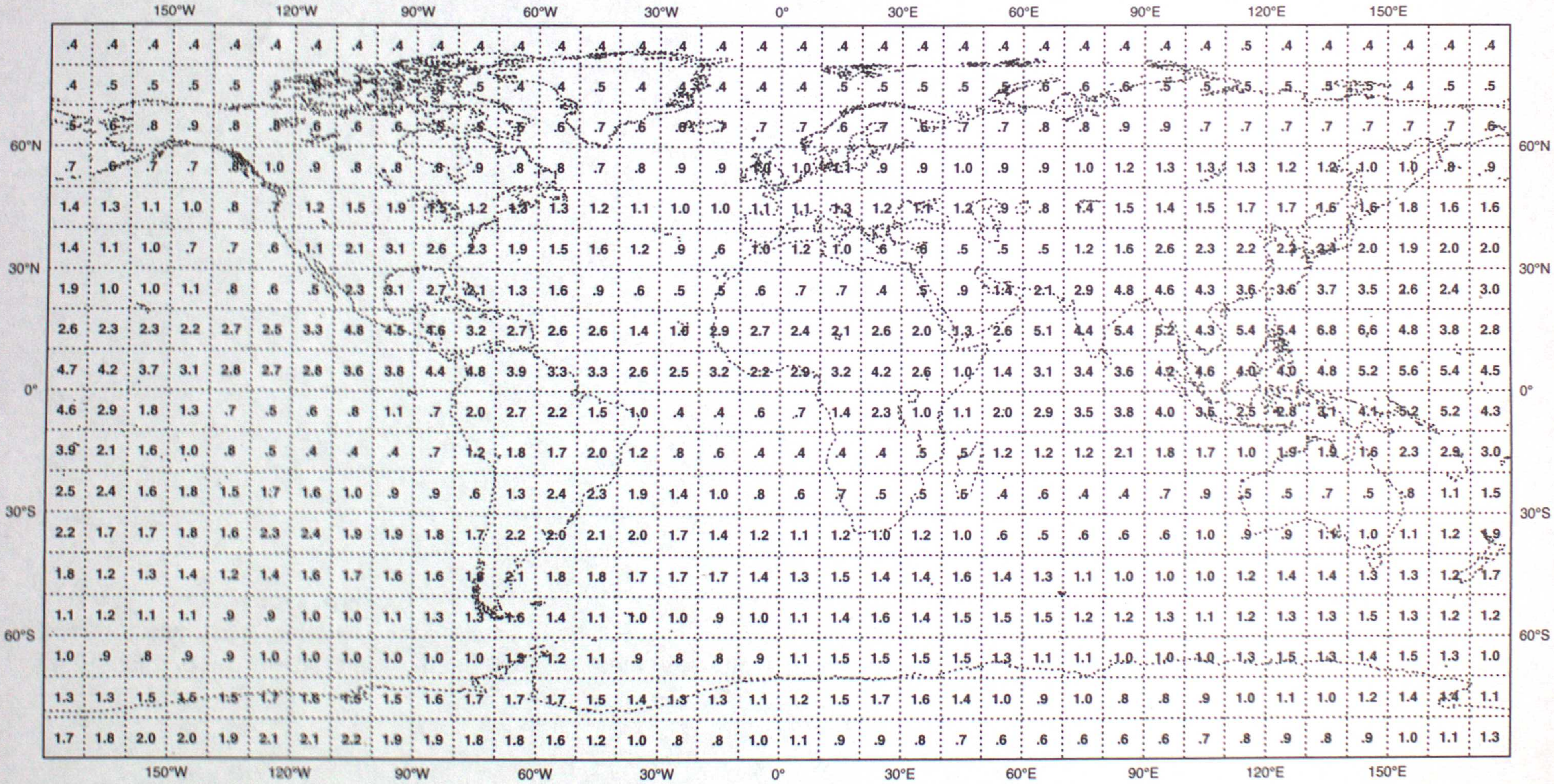

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4
.4	.5	.5	.5	.5	.5	[illegible]	[illegible]	[illegible]	[illegible]	.5	.4	.4	.5	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.6	.6	.6	.5	.5	.5	.5	.5	.5	.4	.5	.5
.5	.6	.8	.9	.8	.8	.6	.6	.6	.5	.5	.5	.6	.7	.6	.6	.7	.7	.7	.6	.7	.6	.7	.7	.8	.8	.9	.9	.7	.7	.7	.7	.7	.7	.7	.6
.7	.6	.7	.7	.8	1.0	.9	.8	.8	.8	.9	.8	.8	.7	.8	.9	.9	1.0	1.0	1.1	.9	.9	1.0	.9	.9	1.0	1.2	1.3	1.3	1.3	1.2	1.2	1.0	1.0	.8	.9
1.4	1.3	1.1	1.0	.8	.7	1.2	1.5	1.9	1.5	1.2	1.3	1.3	1.2	1.1	1.0	1.0	1.1	1.1	1.3	1.2	1.1	1.2	.9	.8	1.4	1.5	1.4	1.5	1.7	1.7	1.6	1.6	1.8	1.6	1.6
1.4	1.1	1.0	.7	.7	.6	1.1	2.1	3.1	2.6	2.3	1.9	1.5	1.6	1.2	.9	.6	1.0	1.2	1.0	.6	.6	.5	.5	.5	1.2	1.6	2.6	2.3	2.2	2.2	2.4	2.0	1.9	2.0	2.0
1.9	1.0	1.0	1.1	.8	.6	.5	2.3	3.1	2.7	2.1	1.3	1.6	.9	.6	.5	.5	.6	.7	.7	.4	.5	.9	1.4	2.1	2.9	4.8	4.6	4.3	3.6	3.6	3.7	3.5	2.6	2.4	3.0
2.6	2.3	2.3	2.2	2.7	2.5	3.3	4.8	4.5	4.6	3.2	2.7	2.6	2.6	1.4	1.0	2.9	2.7	2.4	2.1	2.6	2.0	1.3	2.6	5.1	4.4	5.4	5.2	4.3	5.4	5.4	6.8	6.6	4.8	3.8	2.8
4.7	4.2	3.7	3.1	2.8	2.7	2.8	3.6	3.8	4.4	4.8	3.9	3.3	3.3	2.6	2.5	3.2	2.2	2.9	3.2	4.2	2.6	1.0	1.4	3.1	3.4	3.6	4.2	4.6	4.0	4.0	4.8	5.2	5.6	5.4	4.5
4.6	2.9	1.8	1.3	.7	.5	.6	.8	1.1	.7	2.0	2.7	2.2	1.5	1.0	.4	.4	.6	.7	1.4	2.3	1.0	1.1	2.0	2.9	3.5	3.8	4.0	3.5	2.5	2.8	3.1	4.1	5.2	5.2	4.3
3.9	2.1	1.6	1.0	.8	.5	.4	.4	.4	.7	1.2	1.8	1.7	2.0	1.2	.8	.6	.4	.4	.4	.4	.5	.5	1.2	1.2	1.2	2.1	1.8	1.7	1.0	1.9	1.9	1.6	2.3	2.9	3.0
2.5	2.4	1.6	1.8	1.5	1.7	1.6	1.0	.9	.9	.6	1.3	2.4	2.3	1.9	1.4	1.0	.8	.6	.7	.5	.5	.5	.4	.6	.4	.4	.7	.9	.5	.5	.7	.5	.8	1.1	1.5
2.2	1.7	1.7	1.8	1.6	2.3	2.4	1.9	1.9	1.8	1.7	2.2	2.0	2.1	2.0	1.7	1.4	1.2	1.1	1.2	1.0	1.2	1.0	.6	.5	.6	.6	.6	1.0	.9	.9	1.1	1.0	1.1	1.2	1.9
1.8	1.2	1.3	1.4	1.2	1.4	1.6	1.7	1.6	1.6	1.8	2.1	1.8	1.8	1.7	1.7	1.7	1.4	1.3	1.5	1.4	1.4	1.6	1.4	1.3	1.1	1.0	1.0	1.0	1.2	1.4	1.4	1.3	1.3	1.2	1.7
1.1	1.2	1.1	1.1	.9	.9	1.0	1.0	1.1	1.3	1.3	1.6	1.4	1.1	1.0	1.0	.9	1.0	1.1	1.4	1.6	1.4	1.5	1.5	1.5	1.2	1.2	1.3	1.1	1.2	1.3	1.3	1.5	1.3	1.2	1.2
1.0	.9	.8	.9	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.2	1.1	.9	.8	.8	.9	1.1	1.5	1.5	1.5	1.5	1.3	1.1	1.1	1.0	1.0	1.0	1.3	1.5	1.3	1.4	1.5	1.3	1.0
1.3	1.3	1.5	1.6	1.5	1.7	1.8	1.5	1.5	1.6	1.7	1.7	1.7	1.5	1.4	1.3	1.3	1.1	1.2	1.5	1.7	1.6	1.4	1.0	.9	1.0	.8	.8	.9	1.0	1.1	1.0	1.2	1.4	1.4	1.1
1.7	1.8	2.0	2.0	1.9	2.1	2.1	2.2	1.9	1.9	1.8	1.8	1.6	1.2	1.0	.8	.8	1.0	1.1	.9	.9	.8	.7	.6	.6	.6	.6	.6	.7	.8	.9	.8	.9	1.0	1.1	1.3

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

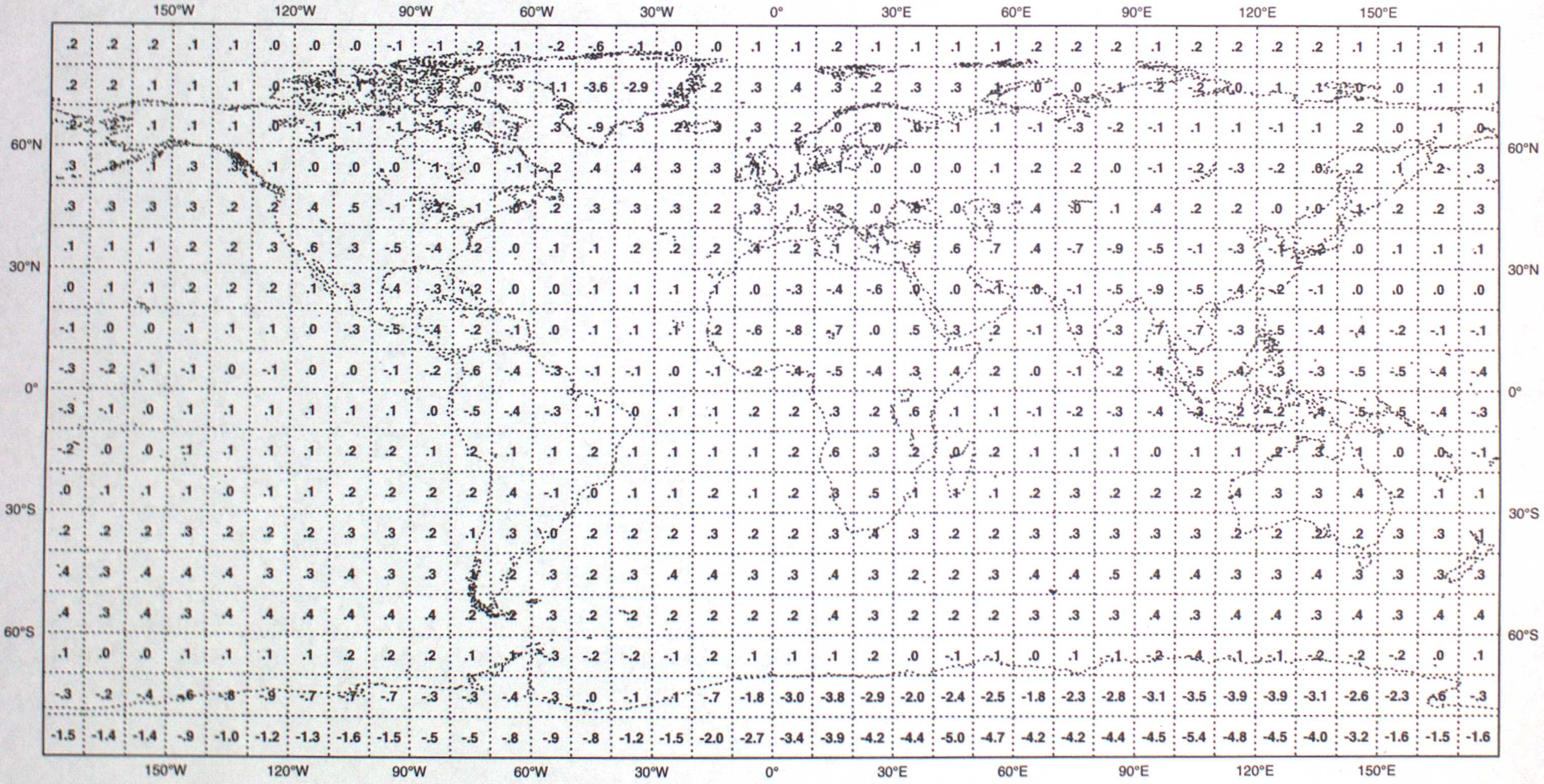

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

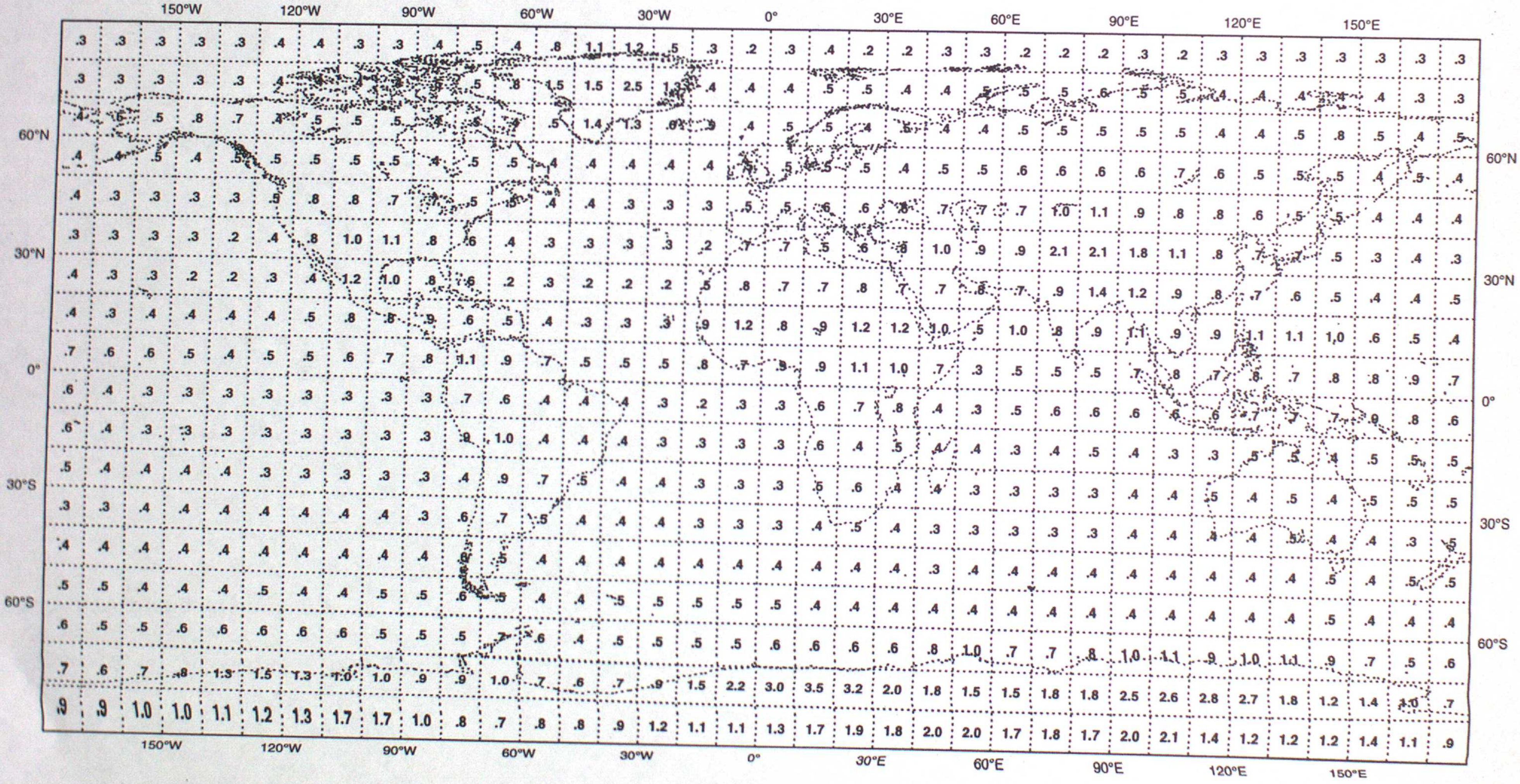

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

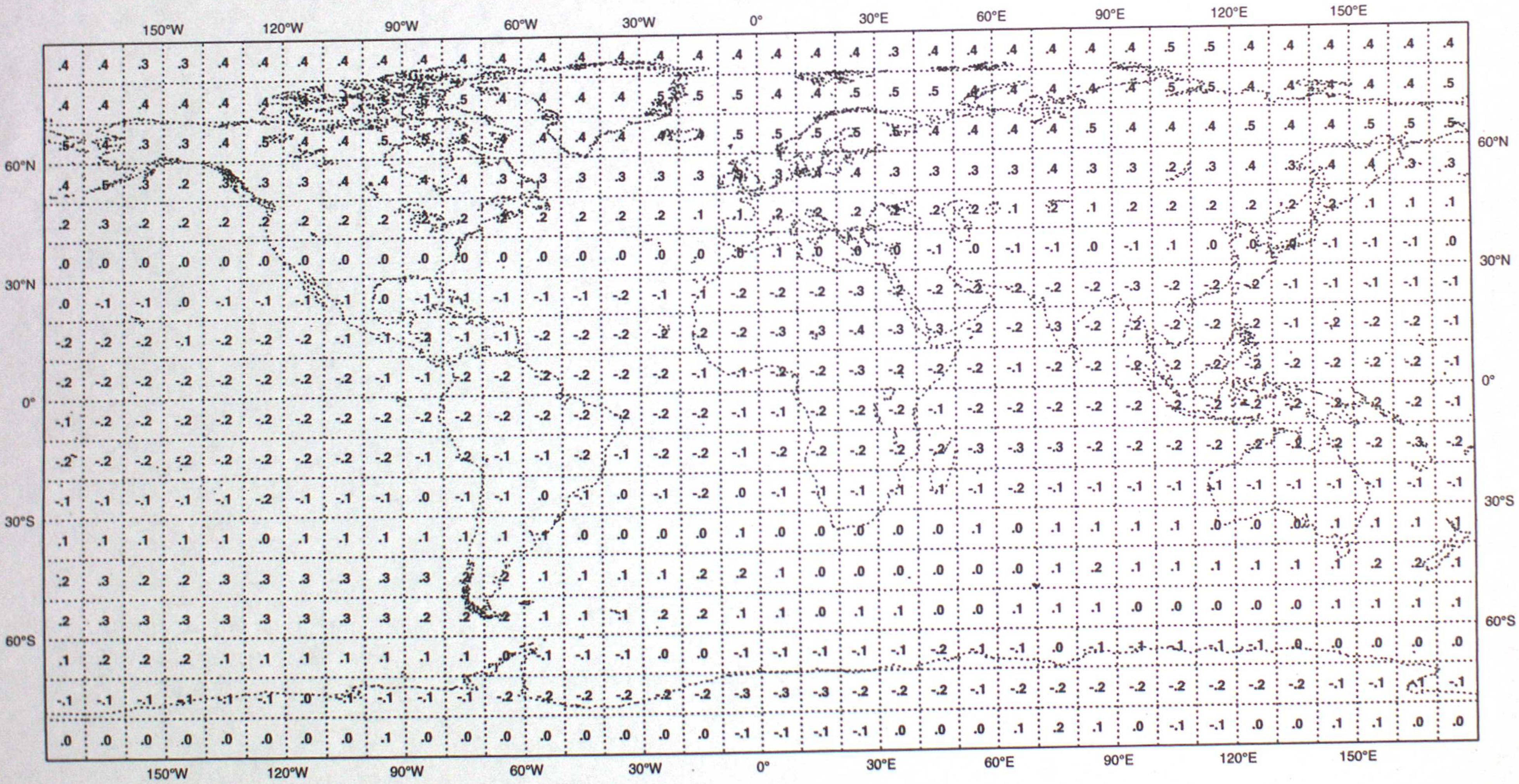

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .3 .5 .5 .5 .4 .4 .4 .4 .5 .5 .5 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .5
.5 .4 .3 .3 .4 .5 .4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .4 .4 .4 .5 .4 .4 .5 .5 .5
.4 .5 .3 .2 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3 .3 .3 .3 .4 .3 .3 .2 .3 .4 .3 .4 .4 .3 .3
.2 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .2 .2 .2 .2 .2 .2 .1 .2 .1 .2 .2 .2 .2 .2 .2 .1 .1 .1
.0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .0 -.1 .0 -.1 -.1 .0 -.1 .1 .0 .0 .0 -.1 -.1 -.1 .0
.0 -.1 -.1 .0 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.1 -.2 -.2 -.2 -.3 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.2 -.2 -.2 -.1 -.1 -.1 -.1 -.1
-.2 -.2 -.2 -.1 -.2 -.2 -.2 -.1 -.1 -.2 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.4 -.3 -.3 -.2 -.2 -.3 -.2 -.2 -.2 -.2 -.2 -.1 -.2 -.2 -.2 -.1
-.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.2 -.2 -.3 -.2 -.2 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.3 -.2 -.2 -.2 -.2 -.1
-.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.2 -.2 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1
-.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.2 -.1 -.1 -.2 -.1 -.2 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.2
-.1 -.1 -.1 -.1 -.1 -.2 -.1 -.1 -.1 .0 -.1 -.1 .0 -.1 .0 -.1 -.2 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1
.1 .1 .1 .1 .1 .0 .1 .1 .1 .1 .1 .1 .1 .0 .0 .0 .0 .1 .0 .0 .0 .0 .0 .1 .0 .1 .1 .1 .1 .0 .0 .0 .1 .1 .1 .1
.2 .3 .2 .2 .3 .3 .3 .3 .3 .3 .2 .2 .1 .1 .1 .1 .2 .2 .1 .0 .0 .0 .0 .0 .0 .1 .2 .1 .1 .1 .1 .1 .1 .2 .2 .1
.2 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .1 .1 .1 .2 .2 .1 .1 .0 .1 .1 .0 .0 .1 .1 .1 .0 .0 .0 .0 .0 .1 .1 .1 .1
.1 .2 .2 .2 .1 .1 .1 .1 .1 .1 .1 .0 -.1 -.1 -.1 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.1 .0 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 .0 .0
-.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.2 -.2 -.2 -.1 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.2 -.1 -.1 -.1 -.1
.0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .0 .0 .0 .1 .2 .1 .0 -.1 -.1 .0 .0 .1 .1 .0 .0

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

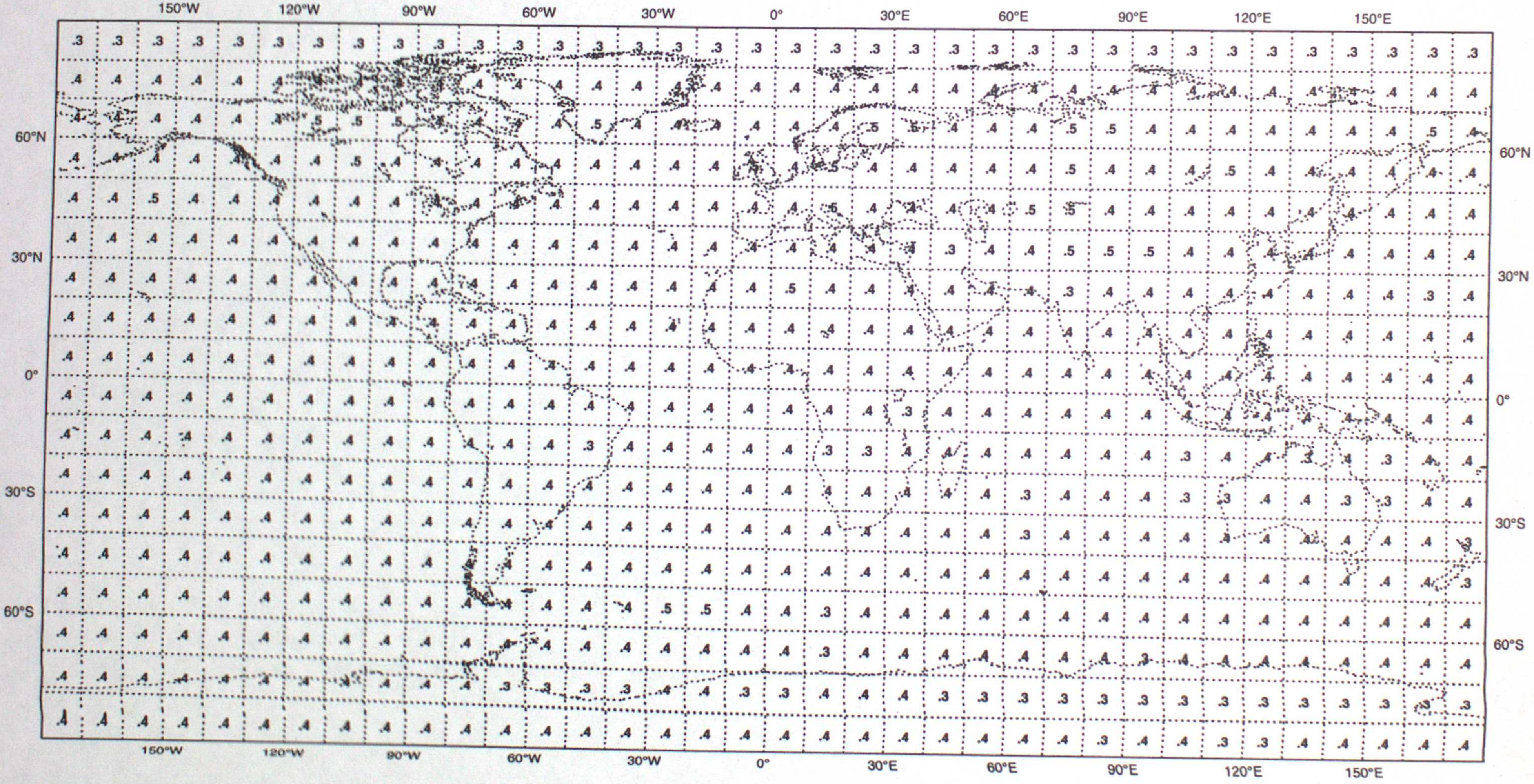

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

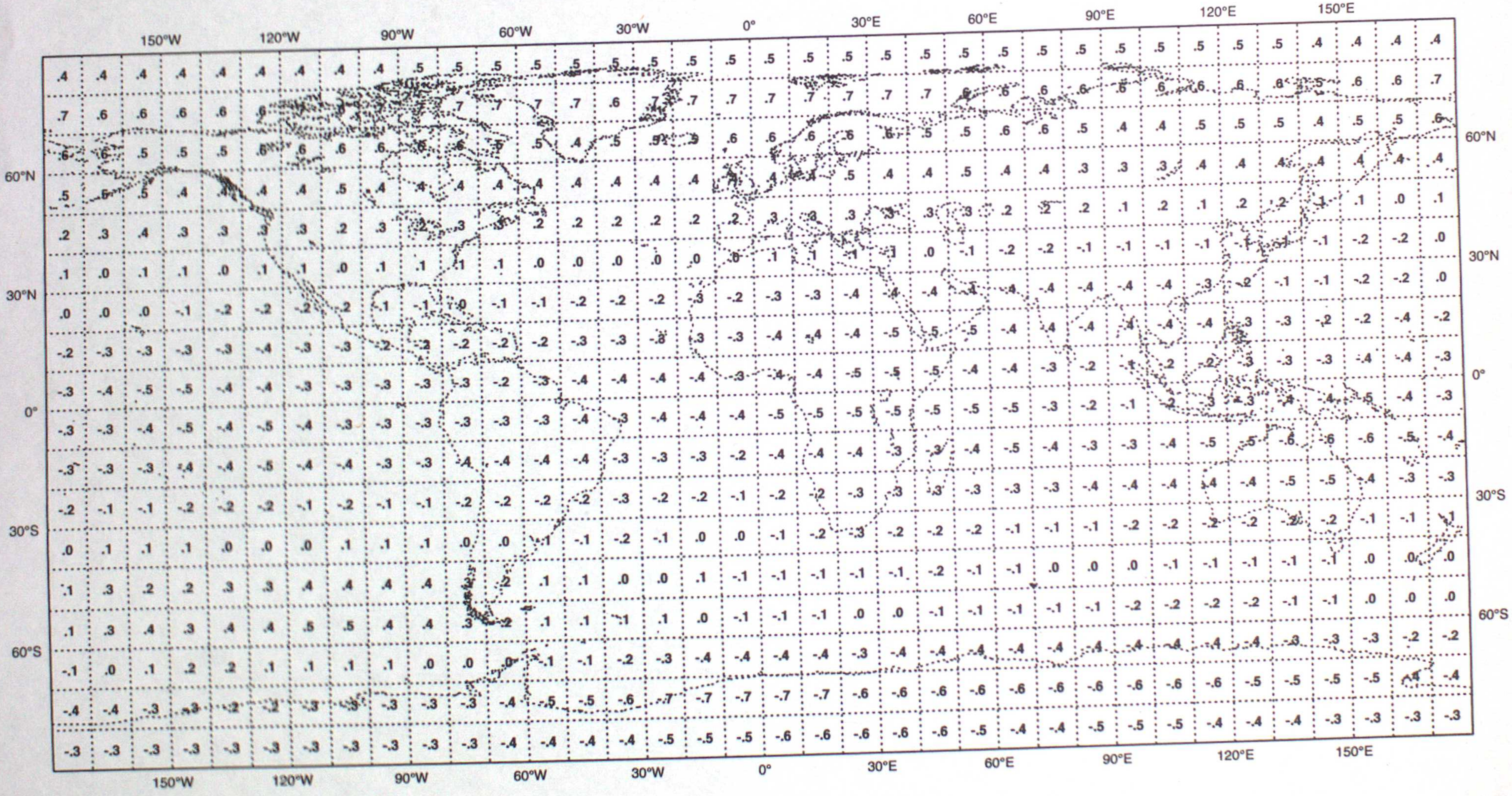

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). JUNE 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

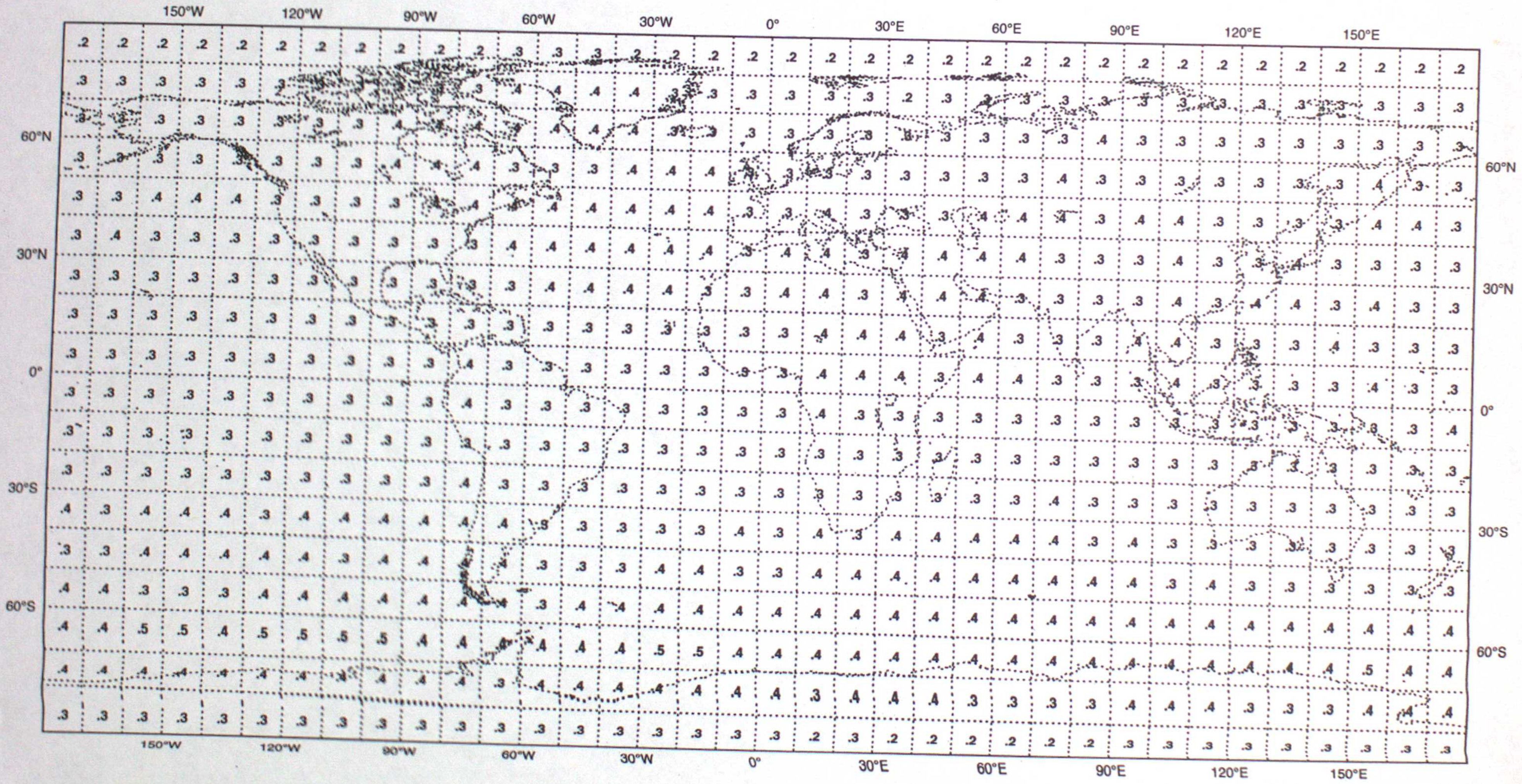

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13531	21.3	-29.0	P	708	0	3	0.6	0.0	0.6
13533	17.3	-52.0	P	677	21	22	0.4	0.4	0.6
13600	19.8	-41.3	P	501	0	11	0.5	1.2	1.3
13602	20.3	-40.9	P	414	0	2	0.5	0.4	0.6
20501 OU	61.2	-48.1	P	1	0	0	0.0	-1.3	1.3
41504	24.5	-84.8	P	1136	0	66	1.0	-0.1	1.0
41520	19.2	-55.9	P	1013	0	68	0.5	-0.2	0.5
41590	25.3	-63.8	P	529	0	2	0.5	1.4	1.5
41594	23.7	-43.3	P	546	0	1	0.5	-0.1	0.5
41595	24.3	-39.7	P	521	0	1	0.5	0.7	0.9
41600	40.4	-53.6	P	611	0	1	0.9	-0.3	0.9
41601	37.7	-41.6	P	604	0	1	0.6	-0.1	0.6
41631	31.2	-74.8	P	439	0	0	0.5	1.1	1.2
41646	28.6	-77.2	P	467	0	1	0.6	0.8	1.0
41655	23.4	-58.7	P	457	0	2	0.6	1.0	1.2
44546	51.5	-17.0	P	589	0	0	0.5	-0.2	0.6
44547	56.5	-40.7	P	632	0	1	0.8	-0.4	0.9
44549	50.0	-49.4	P	14	0	0	0.5	-0.3	0.6
44551	54.0	-17.2	P	646	0	2	0.7	0.6	1.0
44603	60.2	-10.5	P	717	0	3	0.6	0.0	0.6
44606	28.8	-62.3	P	567	0	1	0.4	-0.2	0.5
44609	58.8	-12.5	P	644	0	2	0.8	-0.8	1.1
44612	54.1	-19.8	P	578	0	1	0.5	-0.3	0.5
44613	62.7	-3.1	P	1097	0	41	0.5	-0.8	1.0
44614	61.0	-39.8	P	666	0	2	0.7	-1.1	1.3
44617	46.6	-44.5	P	593	0	1	0.8	-0.1	0.8
44623	30.8	-46.0	P	673	0	1	0.5	-0.1	0.5
44624	52.0	-43.3	P	597	0	1	0.7	-0.1	0.7
44625	60.2	-36.9	P	639	0	3	0.9	0.3	0.9
44626	42.8	-52.3	P	602	0	6	1.5	0.6	1.6
44627	48.9	-32.1	P	756	0	21	0.8	-0.2	0.8
44628	33.5	-25.6	P	659	0	2	0.5	-0.9	1.0
44630	28.1	-34.2	P	731	0	11	0.6	0.2	0.6
44742	49.9	-31.3	P	566	0	1	0.8	0.5	1.0
44743	49.0	-22.9	P	561	0	0	0.6	0.0	0.6
44744	48.5	-27.8	P	482	0	9	2.0	-0.7	2.1
44745	51.0	-27.4	P	699	0	1	0.8	0.0	0.8
44747	48.9	-20.4	P	519	0	1	0.5	0.9	1.0
44761	52.2	-37.5	P	644	0	8	1.0	0.0	1.0
44762	54.2	-36.0	P	60	0	0	1.2	0.0	1.2
44765	42.7	-43.4	P	560	0	0	0.8	-0.8	1.1
44766	50.2	-23.5	P	657	0	16	0.7	0.0	0.7
44771	46.9	-14.0	P	94	0	27	0.5	-0.1	0.5
44773	64.3	-31.7	P	295	0	24	0.7	-0.2	0.7
44777	24.3	-31.0	P	271	0	14	0.5	-0.3	0.6
44778	32.7	-21.6	P	266	0	17	0.5	0.1	0.5
44780	63.2	-16.4	P	662	0	40	0.5	-0.4	0.6
48613	75.2	-15.1	P	409	0	1	1.0	0.1	1.0
62514	30.8	-28.1	P	700	0	1	0.5	0.3	0.6
62517	28.7	-39.5	P	706	0	1	0.6	-0.6	0.9
62551	33.1	-20.0	P	713	0	4	0.6	-0.3	0.6
62556	42.3	-14.5	P	701	0	1	0.5	-0.1	0.5
62557	43.2	-12.6	P	703	0	1	0.7	0.0	0.7
62558	44.2	-19.1	P	699	0	1	0.5	0.0	0.5
62559	46.9	-17.8	P	663	0	10	2.4	0.5	2.4
62560	43.0	-16.1	P	28	0	0	0.3	0.6	0.6
62561	48.9	-21.6	P	122	0	3	1.2	-0.1	1.2
62562	52.0	-22.5	P	162	0	0	1.0	0.0	1.0
62563	54.0	-24.9	P	513	0	1	0.6	-0.4	0.7
62564	45.8	-19.5	P	66	0	2	0.3	0.1	0.3

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62565         52.4  -19.9    P      528    0     1   0.7   -0.2    0.7
62566         55.6  -30.2    P      489    0     0   0.6   -0.5    0.8
62576         44.4  -11.3    P      658    0     1   0.6    0.1    0.6
62694         50.8  -16.3    P      578    0     1   0.5    0.0    0.5
62712         62.6   -6.9    P      656    0     3   0.5   -0.1    0.5

62801         32.1  -19.9    P      627    0     3   0.7    0.2    0.7
64524         61.5  -31.8    P       59    0     2   0.5   -0.1    0.5
64608         64.2  -29.9    P      663    0     0   0.5   -0.6    0.8
65597         51.8  -41.9    P      391    0    24   0.9   -0.7    1.1
65598         57.8  -31.6    P      349    0    28   1.0   -0.5    1.1

65599         58.4  -31.9    P      261    1    23   0.8   -0.4    0.9
65600         58.5  -41.9    P      111    0    15   0.6   -0.5    0.8

IDENTIFIER   LAT.  LONG.  ELEM    NOBS  PGE  %REJ    SD   BIAS    RMS

13600         19.8  -41.3  SPEED    500    0   100   0.7   -1.8    2.0
13602         20.3  -40.9  SPEED    412    0   100   0.7   -1.4    1.6
41590         25.3  -63.8  SPEED    386    0   100   3.1   -0.6    3.2
41594         23.7  -43.3  SPEED    136    0   100   7.0    4.7    8.5
41595         24.3  -39.7  SPEED    381    0   100   1.2   -0.6    1.4

44546         51.5  -17.0  SPEED    588    0   100   1.7   -0.3    1.7
44551         54.0  -17.2  SPEED    471    0   100   2.4   -0.7    2.5
48613         75.2  -15.1  SPEED    401    1   100   1.0   -0.3    1.1
62565         52.4  -19.9  SPEED    412    0   100   2.0   -0.1    2.0
62566         55.6  -30.2  SPEED    352    0   100   1.8   -0.1    1.8


IDENTIFIER   LAT.  LONG.  ELEM    NOBS  PGE  %REJ    SD   BIAS    RMS

13600         19.8  -41.3  DIRN.    273    0     0  28.3   15.0   32.0
13602         20.3  -40.9  DIRN.    276    0     0   8.0  -22.0   23.4
41590         25.3  -63.8  DIRN.     30    0     0  27.5    1.6   27.6
41594         23.7  -43.3  DIRN.     68    0     0   7.9  -11.3   13.8
41595         24.3  -39.7  DIRN.     34    0     0  12.4  -17.8   21.7

44546         51.5  -17.0  DIRN.    441    0     0  15.1    3.0   15.4
44551         54.0  -17.2  DIRN.    357    0     0  22.3   12.7   25.7
48613         75.2  -15.1  DIRN.     84    5     0  24.0  *****  158.0
62565         52.4  -19.9  DIRN.    356    0     0  20.4   -4.8   20.9
62566         55.6  -30.2  DIRN.    264    0     0  18.4   -7.0   19.7
```

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in $m\ s^{-1}$
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 $m\ s^{-1}$ Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	1081	0	13	1.9	0.1	743	0	10	0	8.2	0.0
ACA	1160	0	2	1.6	-0.3	738	0	2	0	5.2	0.5
AEA	329	0	3	1.5	0.1	308	0	7	0	11.0	-1.9
AEL	170	0	5	1.3	-0.5	161	1	9	0	8.4	-0.9
AFL	515	1	4	1.9	0.2	271	0	3	0	7.6	-0.5
AFR	776	0	5	1.5	-0.1	754	0	7	0	9.8	-0.5
AJM	248	0	1	1.4	-0.3	195	0	4	0	8.7	-0.8
AMT	59	2	10	1.6	0.3	58	2	12	0	7.4	1.2
AMX	279	2	3	1.4	0.2	241	0	77	0	9.2	-1.0
AVA	36	0	0	1.5	0.2	36	0	3	0	9.2	-2.0
AZA	362	1	3	1.6	0.0	283	0	5	0	9.4	0.0
BAL	253	1	11	1.4	-0.4	249	1	14	0	10.3	-1.3
BAW	559	1	13	1.8	-0.7	376	0	16	0	5.9	0.3
BPA	207	0	11	1.8	-0.5	212	0	11	0	8.7	-1.1
BWA	176	0	4	1.7	-0.6	156	0	13	0	14.6	-2.3
CFC	35	0	6	1.4	-0.1	34	0	9	0	6.5	1.0
CFG	481	1	5	1.4	-0.1	403	0	7	0	10.7	-1.3
CKS	220	0	13	2.8	0.8	166	1	5	0	7.5	0.2
CLX	263	0	1	1.8	-0.7	174	1	3	0	7.6	0.4
COA	144	0	44	1.3	-0.2	101	0	55	0	9.8	-1.5
CRL	298	0	2	1.4	0.3	282	0	6	0	12.3	-1.7
CUB	128	2	2	1.6	-0.6	112	0	5	0	11.1	-1.4
DAL	999	0	7	1.8	-0.4	683	0	7	0	9.6	-0.3
DCE	35	0	11	2.0	0.1	35	0	20	0	14.7	-1.6
DHL	155	3	100	6.6	-6.5	94	1	67	0	11.0	3.1
DLH	665	0	11	1.7	-0.2	631	0	11	0	6.2	0.8
DRD	77	3	8	2.1	0.1	72	0	14	0	13.7	-4.3
DRI	21	0	0	1.6	0.3	20	0	0	0	5.8	0.7
EDW	34	0	0	1.0	-0.2	23	0	4	0	11.6	-0.6
EEZ	51	6	22	2.7	0.9	51	0	12	0	6.8	0.5
EIA	320	1	76	3.0	1.0	315	0	100	0	21.6	7.1
ELY	122	0	4	1.7	0.0	92	0	5	0	8.8	0.1
ETH	39	0	10	1.2	0.3	40	0	15	0	7.9	-0.2
FCA	130	1	2	1.6	0.2	110	0	6	0	10.4	-0.2
FDX	494	0	28	1.4	0.3	381	1	28	0	6.8	0.7
FIN	390	0	5	1.8	0.0	297	0	4	0	5.7	0.5
FWI	315	0	3	1.7	-0.4	298	0	9	0	11.2	-1.3
GAF	33	0	6	2.0	-1.1	22	0	0	0	4.0	0.0
GCO	125	0	15	1.8	0.2	126	0	16	0	9.4	0.9
GRL	88	1	5	1.7	0.6	80	0	3	0	4.9	0.4
GTI	181	0	14	1.8	0.4	171	0	15	0	6.4	0.6
HXL	158	1	5	1.7	0.5	121	0	7	0	10.0	-0.6
IBE	1349	0	6	1.4	0.3	1353	0	10	0	11.3	-1.6
ICE	1181	0	4	1.6	-0.3	711	0	4	0	6.1	0.3
IWD	165	1	5	1.9	0.0	164	0	14	0	13.0	-1.2
KLM	974	0	1	1.7	-0.2	658	0	5	0	9.9	-0.7
LAN	51	0	12	2.3	0.1	53	0	11	0	12.3	-1.1
LDI	232	1	4	1.9	0.2	189	0	3	0	9.5	-1.9
LOT	237	1	5	2.0	-0.5	159	0	5	0	7.8	-0.5
LTU	603	0	4	1.5	-0.2	489	1	6	0	8.2	-0.1
MMZ	48	0	4	1.6	0.6	52	2	13	0	11.7	-1.5
MON	51	0	4	1.9	0.0	29	0	3	0	6.2	1.1
MPD	181	1	3	1.4	0.4	169	0	4	0	8.8	-0.6
MPH	384	1	3	1.8	-1.0	275	0	2	0	8.1	-0.6
MYT	241	0	8	2.2	0.5	176	0	5	0	8.8	-0.2
NCA	42	0	2	2.0	0.0	34	0	3	0	11.2	2.8
NWA	1733	0	2	1.7	0.3	1680	0	3	0	7.2	0.5
OAE	103	0	10	1.7	-0.1	63	0	49	0	18.7	5.0
OOM	169	0	7	2.0	-1.4	109	0	7	0	4.3	0.7

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS

PAC	130	0	7	1.6	-0.1	90	0	7	0	7.5	1.0
PLM	97	0	3	1.6	0.6	92	0	10	0	12.7	-2.7
RAM	258	0	6	2.0	0.6	166	0	9	0	13.1	-2.4
RCH	162	2	100	4.4	-2.4	138	0	100	0	16.5	1.0
RRR	147	2	12	1.9	-0.4	149	1	12	0	7.8	1.1
RZO	303	0	4	1.4	-0.7	243	0	12	0	15.2	-2.7
SEU	111	0	1	1.5	0.2	97	0	4	0	11.0	-1.1
SSV	38	3	8	2.2	-0.4	28	0	0	0	4.3	1.2
TAG	35	0	0	1.7	0.7	21	0	0	0	4.3	-0.2
TAP	268	1	2	1.4	-0.6	207	0	7	0	13.0	-2.6
TCX	81	1	9	1.6	0.2	48	4	19	0	11.7	0.7
TSC	329	0	3	1.8	-0.5	240	0	3	0	6.9	0.8
UAE	31	0	16	1.5	-0.1	32	0	19	0	11.6	0.1
UAL	226	1	57	2.0	-1.2	155	0	59	0	9.3	1.3
UPS	1077	1	51	1.7	-0.2	1051	0	50	0	7.4	0.1
VIR	207	1	6	1.7	0.0	131	0	8	0	8.2	0.5
VVJ	22	0	0	1.2	-0.2	22	0	9	0	17.4	-4.5
WOA	256	0	7	1.6	0.1	207	0	14	0	10.3	0.6
XLA	52	0	6	1.6	-0.1	50	0	6	0	8.8	-0.8

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
EU	32395	0	18	1.2	0.1	32395	0	17	0	4.0	0.3
TN	60	0	7	1.7	1.0	54	0	7	0	5.2	0.1
N	699	1	5	2.1	0.4	418	0	2	0	6.5	0.2
US ACARS	20043	0	29	1.5	0.2	20043	0	28	0	4.7	0.2

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	6	0	11.6	20.6	17.0
DBBH	12	Z	100	6	0	10.6	17.5	14.0
DBLK	12	Z	100	14	0	23.4	26.8	13.1
EBUQ	12	Z	100	18	0	11.7	12.3	3.6
ELML7	00	Z	100	6	0	9.9	11.7	6.2
ELML7	12	Z	100	7	0	10.6	22.9	20.3
FQFL	00	Z	100	3	1	9.6	15.4	12.0
FQFL	12	Z	100	6	0	40.7	59.7	43.7
FQFM	00	Z	100	7	0	11.6	12.6	-4.7
FQFM	12	Z	100	12	0	16.3	16.4	-2.4
KHRH	00	Z	100	5	0	10.0	16.3	12.8
KHRH	12	Z	100	5	1	31.4	48.4	36.8
KRPD	00	Z	100	4	0	10.9	18.1	14.5
KRPD	12	Z	100	2	0	140.5	173.3	-101.5
LDWR	00	Z	100	28	0	8.8	10.5	5.8
LDWR	12	Z	100	29	0	10.4	11.2	4.2
OXVH2	00	Z	100	7	0	14.9	28.4	24.1
OXVH2	12	Z	100	5	0	5.8	19.7	18.8
OXYH2	00	Z	100	6	0	8.4	24.8	23.3
OXYH2	12	Z	100	4	0	13.6	36.2	33.5
V2XM	00	Z	100	2	0	2.5	15.7	15.5
V2XM	12	Z	100	3	0	15.3	29.0	24.7
WAAH	00	Z	100	7	0	16.3	16.9	4.6
WAAH	12	Z	100	7	0	11.5	12.5	5.0
WPKD	00	Z	100	7	0	9.7	16.8	13.7
WPKD	12	Z	100	5	0	4.8	21.1	20.6
ZCBP6	00	Z	100	9	0	53.1	55.5	16.3
ZCBP6	12	Z	100	10	0	28.4	38.7	26.3
03953	00	Z	100	27	0	11.8	19.4	15.4
03953	12	Z	100	30	0	13.1	17.6	11.8
04018	00	Z	100	28	0	9.4	18.4	15.8
04018	12	Z	100	30	0	10.8	22.3	19.5
04220	00	Z	100	26	0	8.8	18.1	15.8
04220	12	Z	100	30	0	10.9	20.1	16.9
04270	00	Z	100	28	0	7.5	13.8	11.6
04270	12	Z	100	30	0	7.4	20.7	19.3
04339	00	Z	100	27	1	8.3	23.0	21.4
04339	12	Z	100	30	0	10.0	24.1	21.9
04360	00	Z	100	28	0	16.3	21.0	13.2
04360	12	Z	100	30	0	15.2	21.1	14.7
08001	00	Z	100	17	3	20.1	21.9	-8.7
08001	12	Z	100	25	2	25.6	25.6	-0.8
08508	12	Z	100	26	0	13.8	20.2	14.8
08522	12	Z	100	28	0	11.7	12.0	2.7
08594	12	Z	100	20	0	25.9	27.6	9.5
71600	00	Z	100	28	0	13.5	14.0	3.5
71600	12	Z	100	30	0	12.7	17.3	11.8
72201	00	Z	100	27	0	11.9	26.7	23.9
72201	12	Z	100	30	0	10.1	34.9	33.4
72402	00	Z	100	27	0	9.0	14.6	11.5
72402	12	Z	100	30	0	11.2	18.3	14.5
74494	00	Z	100	22	0	9.9	18.3	15.4
74494	12	Z	100	25	0	11.5	11.8	2.8
78016	00	Z	100	27	0	10.3	18.6	15.5
78016	12	Z	100	28	0	13.7	28.8	25.3

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	6	0	6.9	6.9	0.3
DBBH	12	Z	500	6	0	5.1	6.6	4.2
DBLK	12	Z	500	14	0	20.7	21.9	7.3
EBUQ	12	Z	500	18	0	5.2	6.1	-3.1
ELML7	00	Z	500	6	0	3.2	4.2	-2.7
ELML7	12	Z	500	7	0	7.8	8.0	1.9
FQFL	00	Z	500	3	1	3.8	10.1	9.3
FQFL	12	Z	500	4	2	7.2	13.4	11.3
FQFM	00	Z	500	9	0	13.7	16.8	-9.8
FQFM	12	Z	500	12	0	4.9	5.9	-3.2
KHRH	00	Z	500	5	0	11.9	13.4	6.2
KHRH	12	Z	500	6	0	16.3	24.3	18.0
KRPD	00	Z	500	4	0	9.2	9.9	3.8
KRPD	12	Z	500	2	0	64.0	83.1	-53.0
LDWR	00	Z	500	28	0	8.4	9.3	4.0
LDWR	12	Z	500	29	0	7.2	7.3	1.3
OXVH2	00	Z	500	8	0	8.4	12.1	8.6
OXVH2	12	Z	500	5	0	1.6	9.7	9.6
OXYH2	00	Z	500	6	0	7.6	13.8	11.5
OXYH2	12	Z	500	6	0	48.8	49.0	-5.3
SHIP	00	Z	500	1	0	0.0	1.0	-1.0
V2XM	00	Z	500	4	0	6.1	6.2	-0.8
V2XM	12	Z	500	5	0	7.1	7.3	1.8
WAAH	00	Z	500	7	0	5.1	5.1	-0.7
WAAH	12	Z	500	7	0	13.2	13.3	-2.0
WPKD	00	Z	500	7	0	8.5	9.2	3.4
WPKD	12	Z	500	5	0	4.2	9.4	8.4
ZCBP6	00	Z	500	11	0	35.2	35.4	3.8
ZCBP6	12	Z	500	11	0	30.0	35.9	19.8
03953	00	Z	500	28	0	8.2	10.0	5.8
03953	12	Z	500	30	0	6.5	8.5	5.5
04018	00	Z	500	28	0	10.8	13.9	8.6
04018	12	Z	500	30	0	11.7	16.3	11.4
04220	00	Z	500	26	0	7.0	14.5	12.7
04220	12	Z	500	30	0	7.9	13.9	11.5
04270	00	Z	500	28	0	4.7	10.1	9.0
04270	12	Z	500	30	0	5.1	9.8	8.4
04339	00	Z	500	27	1	6.4	14.9	13.4
04339	12	Z	500	30	0	9.2	15.5	12.5
04360	00	Z	500	28	0	9.1	11.8	7.5
04360	12	Z	500	30	0	9.9	13.0	8.4
08001	00	Z	500	22	3	11.4	12.5	-5.3
08001	12	Z	500	26	2	21.6	21.7	-1.9
08508	12	Z	500	27	0	7.7	7.7	0.7
08522	12	Z	500	28	0	7.4	7.4	-0.1
08594	12	Z	500	22	0	6.8	8.4	-4.9
71600	00	Z	500	28	0	8.5	8.7	-2.1
71600	12	Z	500	30	0	7.9	8.9	4.1
72201	00	Z	500	28	0	5.5	5.7	-1.5
72201	12	Z	500	30	0	6.0	6.2	1.4
72402	00	Z	500	27	0	5.5	6.0	2.4
72402	12	Z	500	30	0	9.9	10.4	3.1
74494	00	Z	500	23	0	9.2	9.2	0.3
74494	12	Z	500	28	0	6.0	6.6	2.6
78016	00	Z	500	28	0	5.9	11.0	9.3
78016	12	Z	500	29	0	6.2	15.4	14.1

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	6	0	0	5.0	1.1	1.7
DBBH	12	V	100	6	0	0	5.2	2.6	3.1
DBLK	12	V	100	14	0	0	4.5	0.0	-1.8
EBUQ	12	V	100	16	0	100	9.6	-1.8	4.0
ELML7	00	V	100	6	0	0	8.8	5.8	3.8
ELML7	12	V	100	7	0	0	11.3	8.8	4.3
FQFL	00	V	100	4	0	100	5.1	-1.7	1.4
FQFL	12	V	100	6	0	66	5.0	0.3	1.9
FQFM	00	V	100	7	0	0	3.8	-0.7	0.9
FQFM	12	V	100	12	0	0	3.8	1.7	-1.1
KHRH	00	V	100	3	0	100	8.1	3.0	-1.7
KHRH	12	V	100	5	0	100	18.5	3.7	5.7
KRPD	00	V	100	3	0	0	4.0	-1.0	-0.8
KRPD	12	V	100	2	0	0	6.5	1.8	5.7
LDWR	00	V	100	28	0	0	1.7	-0.3	0.3
LDWR	12	V	100	29	0	0	1.6	-0.1	0.1
OXVH2	00	V	100	5	0	0	1.9	0.0	0.4
OXVH2	12	V	100	4	0	0	2.8	-0.9	0.8
OXYH2	00	V	100	5	0	0	4.6	-1.8	0.7
OXYH2	12	V	100	3	0	0	3.5	-1.2	-2.7
V2XM	00	V	100	2	0	0	2.0	1.0	-0.6
V2XM	12	V	100	1	0	0	1.4	1.3	-0.5
WAAH	00	V	100	3	0	100	6.9	5.3	3.5
WAAH	12	V	100	4	0	100	8.4	6.6	-1.2
WPKD	00	V	100	7	0	100	4.2	0.1	1.8
WPKD	12	V	100	2	0	100	2.0	-0.1	0.6
ZCBP6	00	V	100	7	0	0	4.0	1.0	0.1
ZCBP6	12	V	100	7	0	0	3.5	-1.7	1.1
03953	00	V	100	27	0	0	2.8	0.1	0.7
03953	12	V	100	30	0	0	2.9	0.6	0.7
04018	00	V	100	28	0	0	1.8	0.2	-0.4
04018	12	V	100	30	0	0	2.0	-0.1	0.2
04220	00	V	100	26	0	0	2.7	-0.4	0.0
04220	12	V	100	29	0	0	2.4	0.2	0.2
04270	00	V	100	28	0	0	2.5	-0.8	0.0
04270	12	V	100	30	0	0	2.5	0.0	0.4
04339	00	V	100	26	0	0	4.5	1.0	0.4
04339	12	V	100	28	0	0	3.0	-0.9	-0.2
04360	00	V	100	28	0	0	2.7	-0.4	0.4
04360	12	V	100	28	0	0	2.3	0.4	-0.3
08001	00	V	100	20	0	0	4.2	0.0	-0.1
08001	12	V	100	22	0	0	4.0	0.5	-0.4
08508	12	V	100	11	0	0	3.5	-0.7	0.7
08522	12	V	100	25	0	0	4.3	0.1	0.6
08594	12	V	100	20	0	100	4.1	-0.9	-0.7
71600	00	V	100	28	0	0	3.8	1.1	0.2
71600	12	V	100	29	0	0	3.7	-0.7	-0.5
72201	00	V	100	27	0	0	3.9	1.7	-0.5
72201	12	V	100	30	0	0	3.3	0.7	-0.1
72402	00	V	100	27	0	0	4.3	-1.2	0.8
72402	12	V	100	30	0	0	3.5	-0.6	0.4
74494	00	V	100	22	0	100	2.5	-0.4	0.3
74494	12	V	100	25	0	100	2.5	0.0	0.7
78016	00	V	100	27	0	0	4.4	-0.8	-1.2
78016	12	V	100	28	0	0	4.3	-0.2	1.1

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: June 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	6	0	0	8.7	0.3	3.7
DBBH	12	V	500	6	0	0	4.8	2.3	2.4
DBLK	12	V	500	14	0	0	5.3	-0.1	-0.1
EBUQ	12	V	500	17	0	100	7.7	-1.5	0.1
ELML7	00	V	500	6	0	0	9.3	6.5	3.2
ELML7	12	V	500	7	0	0	8.8	6.7	4.8
FQFL	00	V	500	4	0	100	3.1	0.7	0.2
FQFL	12	V	500	6	0	100	11.1	-5.4	-1.3
FQFM	00	V	500	9	0	0	3.9	-0.1	0.4
FQFM	12	V	500	12	0	0	2.7	-0.2	0.7
KHRH	00	V	500	3	0	100	7.3	0.7	-2.5
KHRH	12	V	500	5	0	100	9.1	2.6	-0.9
KRPD	00	V	500	3	0	0	2.8	0.4	-0.5
KRPD	12	V	500	2	0	0	8.4	5.6	-4.1
LDWR	00	V	500	28	0	0	3.0	-0.4	0.3
LDWR	12	V	500	29	0	0	2.6	0.1	0.0
OXVH2	00	V	500	7	0	0	4.2	2.2	-0.2
OXVH2	12	V	500	5	0	0	4.4	1.6	1.4
OXYH2	00	V	500	6	0	0	4.2	-0.7	0.1
OXYH2	12	V	500	4	0	0	3.2	2.4	-0.6
SHIP	00	V	500	1	0	0	2.1	2.1	0.0
V2XM	00	V	500	4	0	0	6.4	0.8	-0.9
V2XM	12	V	500	5	0	0	6.1	-2.3	-0.9
WAAH	00	V	500	4	0	100	9.9	8.8	3.9
WAAH	12	V	500	4	0	100	8.7	6.8	4.6
WPKD	00	V	500	7	0	100	3.8	1.3	-0.4
WPKD	12	V	500	4	0	100	4.0	1.5	1.6
ZCBP6	00	V	500	9	0	0	4.5	-1.7	0.0
ZCBP6	12	V	500	9	0	0	3.8	-1.9	0.1
03953	00	V	500	28	0	0	3.7	-0.2	-0.8
03953	12	V	500	30	0	0	3.2	-0.1	0.5
04018	00	V	500	28	0	0	4.2	-0.8	-0.8
04018	12	V	500	30	0	0	3.8	-0.8	-0.8
04220	00	V	500	26	0	0	3.5	-0.1	0.4
04220	12	V	500	30	0	0	3.7	-0.5	-1.1
04270	00	V	500	28	0	0	2.7	-0.3	0.5
04270	12	V	500	30	0	0	3.8	0.4	1.2
04339	00	V	500	28	0	0	3.8	-0.3	1.2
04339	12	V	500	30	0	0	4.1	0.0	0.3
04360	00	V	500	28	0	0	3.5	-0.9	-0.7
04360	12	V	500	29	0	0	3.2	0.6	-0.5
08001	00	V	500	24	0	0	4.0	-0.4	-0.3
08001	12	V	500	27	0	0	3.3	0.8	-0.1
08508	12	V	500	12	0	0	4.2	-1.1	0.5
08522	12	V	500	27	0	0	3.5	0.0	-0.8
08594	12	V	500	24	0	100	3.3	-1.1	-1.8
71600	00	V	500	28	0	0	3.9	-0.3	-0.1
71600	12	V	500	29	0	0	4.0	0.9	0.0
72201	00	V	500	28	0	0	2.3	-0.1	0.1
72201	12	V	500	30	0	0	2.8	-0.1	-0.6
72402	00	V	500	27	0	0	2.7	0.4	-0.1
72402	12	V	500	30	0	0	2.7	0.2	0.7
74494	00	V	500	23	0	0	3.1	-0.4	0.2
74494	12	V	500	28	0	0	3.5	-0.7	1.8
78016	00	V	500	28	0	0	3.2	-0.8	0.8
78016	12	V	500	29	0	0	3.1	-1.2	0.8

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45